



## 4. DETAILED RESULTS OF STUDY

### 4.1 Planning Assumptions

When the Department of Energy (DOE) directed Kaiser-Hill (K-H) to develop a plan to close the site by 2006, K-H was required to make a number of assumptions in order to develop their plan. K-H identified their major assumptions in the Project Management Plan (PMP). In addition, they included a number of other assumptions in PBD's or other plan documents. This section discusses the major K-H assumptions included in the PMP, as well as other significant assumptions that are not stated explicitly.

#### *Assumptions in the Project Management Plan*

Because a plan to close the site in 2006 represents a dramatic acceleration relative to the 2010 closure plan previously in place, K-H made fundamental changes in closure strategies, tactics, and supporting assumptions. The primary elements of K-H's 2006 Closure Plan strategy, as stated in the Project Management Plan, are:

1. *Eliminate the highest priority risks first. Risk in this context includes schedule, cost and technical risks, as well as safety. Safety and environmental compliance always have first priority.*
2. *Focus on completing first those activities and tasks that have the greatest potential to reduce mortgage costs of the Site.*
3. *Develop and implement new and innovative approaches to performing work within the constraints of facility and operational Authorization Basis (AB). Examine the AB requirements to ensure that they are properly tailored to the changing risk levels.*
4. *Maximize worker efficiency and effectiveness in all site closure activities to the extent practical always insuring that worker safety has first priority.*
5. *Minimize resources dedicated to activities not directly related to site closure activities. Cost savings shall be allocated to activities directly related to site closure.*

Developing the plan for final closure of Rocky Flats in 2006 also required definition of a complete and comprehensive set of assumptions to account for uncertainties, unknowns, and items outside the control of the Project. Following are the K-H PMP assumptions, shown in italics. Each assumption is followed by comments by the Ernst & Young team, where appropriate.

## General Assumptions

The following general assumptions apply to the entire Project.

1. *The Site's end state following closure is as follows:*
  - a) *All buildings are demolished.*
  - b) *All waste and SNM are shipped offsite.*
  - c) *Approximately 100-acres are under closure caps including old landfills and portions of the PA.*
  - d) *Future open space and limited industrial use enabled.*

This assumption is consistent with the defined endstate for the Rocky Flats site. This is a reasonable and necessary assumption.

2. *The M&I Contractor will comply with the U.S. DOE and Kaiser-Hill LLC Contract DE-AC34-95RF00825, as amended and effective on April 15, 1999.*

K-H has been the M&I contractor at RFETS since 1995. The current term of the agreement was set for five years and expires in July 2000. The assumption is reasonable in light of the existing business relationship between the parties.

3. *The current type of M&I contract, as described by Contract DE-AC34-95RF00825 as amended and effective on April 15, 1999, will be used through the closure of the Site.*

The M&I contractor approach has been successfully employed to date at RFETS. This assumption is reasonable in light of the history of the relationship between DOE and K-H. See assumption 2 above.

4. *The regulatory framework established in the RFCA, dated July 19, 1996, will be followed. The Site will plan for annually established RFCA milestones and obligated target activities.*

The RFCP has adequately taken into consideration the requirements and procedures contained in the RFCA. To date the Site has addressed the elements contained in the regulatory Milestones and Target Activities.

5. *Receiver sites and transportation for SNM, waste, and other materials to be shipped offsite will be available as planned (needed). The materials and associated receiver sites are presented in the following table:*

<i>Materials</i>	<i>Receiver Site(s)</i>
<i>SNM Pits</i>	<i>Pantex, LANL, Lawrence Livermore National Laboratory (LLNL)</i>
<i>SNM Metals and Oxides (including IAEA Materials)</i>	<i>Savannah River Site (SRS)</i>
<i>SNM Enriched Uranium</i>	<i>Oak Ridge Y-12 and SRS</i>
<i>Residues</i>	<i>SRS (treatment); WIPP for disposal as TRU waste</i>
<i>TRU Waste</i>	<i>WIPP (disposal); INEEL (treatment); LANL (classified waste treatment)</i>
<i>Low-Level Waste (LLW)</i>	<i>NTS; Envirocare</i>
<i>Low-Level Mixed Waste (LLMW)</i>	<i>Envirocare (&lt;10 nCi/gm) and Hanford or NTS or other commercial sites(&gt;10 nCi/gm) (disposal); Various DOE Sites (treatment)</i>
<i>Classified Documents</i>	<i>Various DOE Sites (LANL, Kansas City, etc.)</i>

These assumptions are reasonable and appear to be supported by DOE. However, decisions are still required regarding final disposition of LLMW. Also, this assumption is silent on potential competition from other DOE sites that are also disposing of waste at the same locations.

6. *The list of key completion activities and quantities of materials to be managed during the RFCP are those described on the Rocky Flats 2006 Closure Metrics Baseline, Revision A.*

These Metrics represent the known quantities of work effort required for closure. They are not exhaustive as some activities are passive and represent the natural diminution in activities that will occur as the site is gradually decommissioned. An example would be in the area of "Site Support" services that will be drawn down as buildings and structures that are part of the Metrics are removed or disposed.

These quantities or Metrics have been estimated and presented by Kaiser-Hill and are tied to various Performance Measures (PM) that represent opportunities for the M&I contractor to be financially rewarded beyond the direct costs of their effort associated with management of the RFETS closure. At this stage in the Closure process (contracts are currently being renegotiated), it would not be unreasonable for the DOE to require the M&I contractor to assume more of the risk associated with program or Metrics shortfalls. In other words, based on the K-H position on the learning curve and their opportunity for a sole source procurement, they could be asked to shoulder more of the risk associated with the 2006 Closure Plan. In the alternative, they could be less generously rewarded for achievement of future Performance Measures.



7. *Work force restructuring will be conducted according with Section 3161 of the Defense Authorization Act and the approved RFETS Work Force Restructuring Plans.*

This assumption appears to be reasonable.

8. *There will be no significant changes to the deployment of personnel under the (1) Collective Bargaining Agreement between K-H and the United Steelworkers of America (AFL-CIOCLC) Local Union 8031, dated October 13, 1996, (2) the Project Labor Agreement (PLA) between K-H and the Colorado Building and Construction Trades Council dated December 16, 1997, (3) the Work Assignment Guidelines dated January 12, 1996, and (4) the Collective Bargaining Agreement between Wackenhut Services, LLC and the United Government Security Officers of America, Local No. 1, dated November 6, 1994.*

This assumption appears to be reasonable in advance of any negotiations.

9. *There will be no additional costs to the RFCP for labor brought in from outside the Denver Metropolitan area beyond that which is paid for local labor.*

This assumption appears to be reasonable; however, this factor can be managed by DOE and Kaiser-Hill rather than be assumed. We did not see evidence of a plan to source labor from outside the Denver area based on labor cost.

10. *There will be no seismic event greater than an intensity of modified Mercalli V, or other natural disaster, such as a tornado or flood, occurring at the Site prior to closure.*

This assumption appears to be reasonable.

11. *No new, additional regulatory changes will occur after April 15, 1999 that increase work scope.*

The assumption appears to be reasonable for planning purposes. In fact, the RFCA requires a review, on an annual basis, of any regulatory changes that could impact the Closure of the Site.

12. *Required NEPA actions to enable closure work at the Site will occur in a way that allows the work to proceed as planned.*

The work activities as presented in the individual WADs and WADlets take into consideration the requirements of NEPA as does the RFCA.

13. *Long-term environmental monitoring and stewardship, M&I contract closeout, ongoing litigation, as well as, maintenance of remedial actions, will be the only DOE funded activities occurring at the Site following closure (assumed to begin in calendar year 2007).*

The RFCP is structured such that the endstate will then allow for these activities to occur and be funded separately.

#### ***Assumptions for Special Nuclear Materials***

The primary goal of Nuclear Operations is to complete processing and off-site shipment of plutonium residues and SNM to allow the PA to close on or before December 2002. In support of this primary goal, the Closure Plan is based on the following assumptions.

1. *No new or significant DNFSB recommendations requiring implementation will be received after April 15, 1999 that negatively impact cost or schedule of the current SNM stabilization, storage or disposition plans.*

This assumption appears to be reasonable.

2. *An adequate supply of certified shipping containers and transportation systems for SNM will be available as planned.*

This is within the control of K-H and DOE and should be managed rather than assumed.

3. *The Site will not bear the costs of offsite SNM transportation and disposition.*

This assumption appears to be reasonable.

4. *Other than the procurement of the 9975 shipping containers, the Site will not bear the costs of SNM shipping containers or obtaining and/or maintaining security clearances.*

This assumption appears to be reasonable.

#### ***Assumptions for D&D***

The primary goal of the Closure Plan Deactivation and Decommissioning (D&D) activities is to complete D&D of all Rocky Flats facilities not required for long term environmental monitoring in 2005 or early 2006 at latest for Type 3 facilities. Type 3 facilities are those with significant contamination or hazard, including Buildings 779, 771/774, 776/777, 707, 559 and 371/374. In support of this primary goal, the Closure Plan is based on the following assumptions.

1. *All above ground facilities and structures, excluding structures needed for long-term environmental monitoring, will be demolished.*

This assumption is consistent with the defined endstate for the Rocky Flats site.

2. *Uncontaminated underground utilities and facility foundations will be abandoned in place unless excavation is required to achieve remediation goals.*

This assumption appears to be reasonable for underground utilities and facility foundations that meet the free-release criteria. Abandonment in place for underground utilities will be subject to regulator approval.

3. *Most asphalt roads and parking lots will either be removed or covered with soil in order to meet water management goals.*

This assumption is consistent with RFCA.

4. *The overall cost savings of process equipment for size reduction by using a centralized size reduction facility is in the range of 20 to 25 percent from current practice.*

This assumption appears to be unreasonable. A savings of this magnitude should be estimated as part of the cost estimate, not assumed.

5. *Buildings 371/374 will have a minimal under-building contamination that will not require a Closure Cap.*

This appears to be a reasonable assumption. However, the ability to close the site without this cap will have to be demonstrated under the guidelines established by RFCA and will have to be considered in light of the final endstate land use designation for this area.

6. *Dose-based limits will be used for facility decontamination as defined in Site Radcon Manual, Revision 2, dated June 1, 1996 or approved Administrative Control Level.*

This assumption appears to be reasonable; however, it is subject to regulatory approval.

7. *All concrete rubble meeting DOE established "free-release criteria" will be used as onsite fill material to reduce the volume of sanitary waste for disposal and to reduce the amount of backfill need to fill in the holes created during site closure.*

This is a reasonable assumption but will still need the **final** approval of the Regulators. If approvals are not granted then some or all of the rubble will need to be disposed of off-site at an additional cost and possibly with some delays in project schedules.

### *Assumptions for ER*

The primary goal of the Environmental Restoration (ER) operational element is to clean up the site based on the soil and groundwater action levels defined in the Rocky Flats Closure Agreement (RFCA). Cleanup will proceed as accelerated actions under CERCLA and in accordance with RFCA. These accelerated actions will be completed and finalized, such that all Corrective Action Decision/Records of Decision (CAD/ROD) will require no further remedial action. Site remediation will be complete in 2006 such that activities in 2007 and beyond will be limited to environmental monitoring and maintenance. In support of this primary goal, the Closure Plan is based on the following assumptions.

1. *Only the IHSSs/Potential Areas of Concern/Under Building Contamination listed in the Lane Butler to Allen Schubert Interoffice Memorandum (JLB-013-99), dated April 6, 1999, will require remediation.*

This assumption does not recognize a number of potentially significant unknowns related to the overall project. There is a potential for the discovery of additional areas of contamination during other scheduled cleanup activities that could impact the overall scope, schedule and cost of the ER efforts. K-H had the option of assuming a percentage or a number of additional IHSS sites, but they assumed that there would be no additional sites. It appears likely that K-H has therefore underestimated the scope of the ER project.

2. *No Further Action (NFA) sites will be identified and dispositioned as defined in Attachment 6 to RFCA. The NFA sites to be dispositioned will be those described in the Lane Butler to Allen Schubert Interoffice Memorandum (JLB-013-99), dated April 6, 1999.*

Because of the "best judgement" basis of many of the initial proposed NA/NFA decisions, there is significant potential cost and schedule risk with IHSSs sites that have been proposed for No Action/No Further Action. If a portion of the 148 sites pending NA/NFA approval, or the 81 additional proposed NA/NFA sites, are not approved by the regulators, then the ER costs and schedule will be adversely impacted.

3. *ER soil action levels will conform to the final Action Levels for Radionuclides in Soils for the Rocky Flats Cleanup Agreement, October 18, 1996. (All soils with radioactivity less than the Tier 2 levels, as defined in RFCA [Attachment 5] can be returned to the remediation site.)*

This assumption does not account for other cleanup levels that may result from the efforts of the Actinide Migration Evaluation Program, which may dictate additional scope related to soil removal and contaminant control activities in order to meet soil cleanup

levels that are protective of downstream surface and groundwater quality. However, this assumption appears to be reasonable for a baseline plan.

4. *The appropriate regulators will approve the use of engineered caps as an integral part of the Site's closure strategy for landfills, for the Solar Ponds, and for areas within the Industrial Area, including the 700 Area.*

The final decision for closure caps for the landfills, solar ponds and Industrial Area may have cost and schedule risks that are not accounted for in the existing RFCP. The closure caps are assumed to be an evapo-transpiration (E-T) design. RFCA requires the caps to be RCRA-equivalent. The cognizant regulatory agencies have not yet accepted the E-T design as RCRA-equivalent. Planning and cost estimates assume that the overall cap structures will be similar to the cover tentatively approved by CDPHE for use at Rocky Mountain Arsenal. It is not clear that alternatives have been fully developed for alternate design of the caps if the E-T design is not approved for RFETS. Potential impacts could include increased cost of cap materials, increased time for design and approval, and impacts to cap construction implementation schedules.

Additionally, specific sources of soil for the closure caps have not been located or placed under contract or commitment. Although the RFCP indicates that soil will be obtained for closure caps from local sources within ten miles of the site, it is not clear that the availability of adequate volumes within that proximity has been evaluated. It is not clear that roadway access to the site, increased traffic volumes, and other transportation infrastructure issues related to the movement of large amounts of soil for the closure caps has been fully evaluated. These issues could create potentially significant schedule and cost impacts to the capping activities.

5. *The appropriate regulators will approve changes to the environmental site remediation schedule to accommodate acceleration of other RFCP activities such as nuclear material stabilization and D&D.*

Due to the late schedule of ER activities within the overall RFETS cleanup plan, the time required for regulatory review and approval of ER remedial actions may become critical issues. Accomplishment of ER work within the existing baseline schedule could be seriously impacted if agency reviews and approvals are delayed or prolonged.

K-H and DOE are currently discussing with the regulatory agencies the possibility of developing an expedited decision document process, in order to reduce agency review and approval time. Under this concept, agency requirements for multiple sets of decision documents would be combined into single, more comprehensive "super" decision documents. The current project baseline schedule shows five Record of Decision (ROD) for site closure, and one full set of decision documents per ER work group, or a total of 58 sets.

6. *All existing dams will remain in place, with the exception of Dam C-1, at the end of the RFCP. Dam C-1 will be modified to enhance ecological values.*

This assumption states clearly that Dam C-1 will be modified, and infers that all other existing dams will not be modified. This is consistent with our analysis of the various WBS scopes of work encompassed by ER.

7. *At closure, surface water leaving the site will meet the existing RFCA standards for plutonium and americium; the surface water standard for plutonium and americium may not be met onsite.*

This assumption is consistent with the overall site guidance provided by RFCA.

### ***Assumptions for Waste Management***

The goal of Waste Management (WM) activities within the RFCP includes safe and compliant management of waste in storage facilities, safe and compliant treatment of mixed wastes at on-site and off-site locations, and safe and compliant disposal at approved off-site repositories. In support of this goal, the Closure Plan is based on the following assumptions.

1. *All concrete rubble meeting DOE established "free-release criteria" will be used as onsite fill material.*

This is a reasonable assumption but will still need the final approval of the Regulators. If approvals are not granted then some or all of the rubble will need to be disposed of off-site at additional cost and possibly with delays in project schedules.

2. *Hazardous, LLW, LLMW, TRU, TRUM, and sanitary waste unsuitable for fill material onsite will be disposed offsite. No significant increases to the planned cost of waste treatment and disposal at DOE or commercial sites will occur during the closure project.*

The RFCP is structured to accomplish the offsite disposal of these types of waste therefore the disposal portion of the assumption is reasonable.

The issues of waste treatment cost and disposal cost are reasonable assumptions for , the DOE disposal sites, since they can be more cost regulated than the current or any future commercial disposal site(s). For commercial sites, however, costs are likely to escalate rapidly, as they have for all types of hazardous wastes in the United States.

3. *LLW and LLMW remediation waste that is generated in excess of shipping and current storage capacities will be managed on an interim basis in onsite storage facilities approved by the appropriate regulators.*

This appears to be a reasonable assumption. The ability to obtain the necessary regulatory approvals to implement this strategy is addressed in RFCA. Also, the RFCP has taken this activity into consideration in several of the WM, WADS and WADlets and in PBD-003.

4. *The Site will not bear the costs of off-site TRU waste transportation or disposal at WIPP.*

This assumption appears to be reasonable.

5. *No significant changes will be made to applicable treatment or disposal site waste acceptance criteria at DOE or commercial sites, or to waste transportation requirements that are in effect on April 15, 1999.*

This appears to be a reasonable assumption. From a historical standpoint, changes have occurred at waste disposal facilities, such as hazardous waste disposal facilities, that resulted in more stringent acceptance criteria. The same can be said for treatment facilities such as incinerators, thermal desorption units, etc. It is conceivable that transportation requirements could significantly change, for instance, if an accident occurs that prompts either a state or local government to make demands that would require these changes.

6. *NTS, as well as other LLW and LLMW DOE and commercial sites will be able to receive bulk waste shipments from Rocky Flats.*

This appears to be a reasonable assumption. However, if the waste repositories encounter any problems with, for instance, their operating permits, major disruptions could occur in the timely acceptance or disposal of wastes.

7. *Projected waste generation and shipping estimates from all sources are those described in Waste Generation, Inventory, and Shipping Forecast (Revision 1, Dated May 7, 1999), Revision 0.*

This is not a reasonable assumption. The site waste unknowns and unresolved cleanup issues could result in much greater waste generation estimates. Some of these issues include: Under Building Contamination (UBC), results and acceptance of the actinide migration levels, removal requirements of sediment in the ponds, soil cleanup levels, the acceptance of the cap(s) design, ultimate land use, etc. Kaiser-Hill had the option of assuming a percentage or an amount of additional waste, but they assumed that there would be no additional waste. Further, we did not see evidence that K-H has a waste minimization plan in place. It appears likely that K-H has therefore underestimated the scope of the WM project.

### ***Assumptions for Safeguards, Security, Site Operations & Integration***

*The primary goal of Safeguards, Security, Site Operations & Integration (SSSO&I) is to provide only those site support and infrastructure services that are necessary and sufficient to achieve safe and compliant Site closure in 2006.*

*In support of this goal, the Plan assumes that, pursuant to DOE Order 5633.3B, Figure 1-2 titled, Nuclear Material Safeguards Categories, safeguards and security support to the RFCP is incrementally reduced as Category I and II quantities of SNM are removed from the Site's nuclear facilities. Once all Site nuclear facilities each contain less than Category III quantities of stored SNM and there remains no credible roll-up to a Category III amount of attractive and available Special Nuclear Material, the Site will adopt a property protection security posture.*

This assumption appears to be reasonable.

### ***Assumptions for Planning & Integration***

The P&I goal is to streamline planning and control activities to a level consistent with providing and requiring only those necessary and sufficient actions critical to supporting the RFCP mission. In support of this goal, the Closure Plan is based on the following assumptions.

1. *Initial downsizing can be completed by the start of FY00.*

This is an operations activity that is within the control of K-H.

2. *Transition of routine planning and control functions, and the related staff, to the subcontractors will occur during FY00.*

This is an operations activity that is within the control of K-H.

3. *Necessary contractual modifications will be put in place to enforce the oversight role of P&I with respect to the major subcontractors.*

This is a negotiated item between DOE and K-H.

4. *The planning and controls automated system requirements will remain essentially unchanged for the duration of the closure project. No major software changes will occur. Existing operating licenses will be maintained through closure. No system or platform migrations will occur.*

This assumption appears to be unrealistic; system, platform, or software changes are likely with more than seven years remaining before closure. However, even if this assumption is not accurate, the overall closure plan is not likely to be affected.



5. *The site will maintain the necessary information system infrastructure to permit continued reliable and cost-effective operations.*

This is a necessary assumption that is within the control of K-H.

#### ***Assumptions for Finance & Administration***

The primary business goal of F&A is to streamline the financial and administrative functions in order to drive costs as low as possible in support of the RFETS Closure Project. In support of this goal, the Closure Plan is based on the following assumptions.

1. *All parent companies have business systems capable of supporting the work at Rocky Flats.*

This is within the control of Kaiser-Hill and should be verified with the parent companies rather than assumed.

2. *Parent company resources (people and systems) will be available to accommodate the financial and administrative work scope, which is planned to be transferred from the Site.*

This is within the control of K-H and should be verified with the parent companies rather than assumed.

#### ***Assumptions for Human Resources & Communications***

1. *The DOE Office of Worker and Community Transition, or a replacement, and its separate funding for work force transition programs will remain in effect.*

No comment.

2. *The Displaced Worker Medical Insurance Continuation program will continue to be renewed by DOE.*

No comment.

3. *K-H will continue in its responsibility for management of fringe benefits liabilities as the M&I contractor for the K-H Team, and all team members will continue to participate in the multi-employer program.*

No comment.

### *Assumptions for Safety Systems and Engineering (SS&E)*

The primary goal of site SS&E is to provide overall integration of safety-related programs that are required to close the site while protecting the workers, public, and environment. This program has assumed that the contract requirements for many of the SS&E programs will be reduced or eliminated when the site proceeds to a non-nuclear facility. This is a reasonable assumption.

### *Assumptions for Environmental Systems & Stewardship*

There are no assumptions other than the Site assumptions.

### *Other Significant Assumptions*

Many assumptions other than those addressed in Section 4.1.1 are included as part of the 2006 Closure Plan. We have extracted other significant assumptions that affect large portions of the Closure Plan, or affect the entire plan. These other significant assumptions are discussed in this section of the report. Other assumptions at the PBD level are discussed in the related sections of this report.

K-H based its Closure Plan on the assumption that the projected funding profile for the 2006 site closure is nearly identical with that projected for the 2010 site closure, except for nominal funding for environmental monitoring in years 2007 through 2010 after closure is complete. This is also an implicit assumption that additional funding will not be made available in any fiscal year, even if additional funding in a particular year would have a significant beneficial effect on the probability of successful closure in 2006. The Plan does not discuss whether successful closure would be more likely if additional funding would be applied to any activities on the critical path.

It appears that K-H has only considered the two possibilities: the projected funding profile from the 2010 plan, and unconstrained funding. We recommend that they consider whether additional funding applied to areas such as Environmental Restoration planning and permitting would improve the likelihood of successful closure in 2006.

Similarly, the Closure Plan is based on the assumption that funding will not be reduced below the projected funding profile. This is a reasonable assumption for the Closure Plan.

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## 4.2 Closure Plan Methodology

### 4.2.1 Closure Project Scope

The scope of the Rocky Flats Closure Project is to achieve the following end state:

- All buildings are demolished
- All waste and SNM are shipped offsite
- Approximately 100 acres will be under closure caps including old landfills and portions of the PA
- Future open space and limited industrial use enabled.

We found that the 2006 Closure Plan is in complete agreement with this scope of work, as are all the participants we interviewed.

### 4.2.2 Closure Project Organization – Work Breakdown Structure

The following documents were reviewed with respect to information on the Work Breakdown Structure guidelines and content used for the 2006 Closure Plan Baseline:

- K-H Planning and Integration Standard Guidelines
- 2006 Project Management Plan
- K-H Facility Disposition Cost Model.

The work plan is organized as follows from highest top lowest level:

- **Project Baseline Description (PBD):** This summary level document describes all technical requirements and work activities contained within each WBS element. All work contained in the scope of work must be represented on the WBS and defined in the PBD.
- **Work Authorization Document (WAD):** This document represents the scope of work for individual projects that make up the overall site closure project. These are organized into the various PBD's based on logical work groups.
- **Work Breakdown Structure (WBS) or WADlet:** This is comprised of the individual activities required to complete the scope of work for a WBS or WADlet.
- **Activities:** These are the individual line items within the schedule that represent the tasks involved to complete a scope of work.

### *Findings*

The WBS was developed prior to the advent of the Project Baseline Description (PBD) and Work Authorization Documents (WADs) and is structured to encompass the entire project

through achievement of the RFCA interim end state. Subsequently the PBDs and WADs were established as logical work groups to achieve the technical requirements to meet the project objectives. The PBD and WAD structure is a DOE requirement for performance reporting at the PBD level, which is similar across many DOE sites.

All work contained in the 2006 Closure Plan Baseline scope must be represented on the WBS and defined in the PBD. Our review of the 2006 CPB Schedule determined that the work was reasonably and logically organized within the PBD. We compared the work scope defined in the PBD with the scope represented at the WBS or WADlet level and found that it adequately and logically represent the work scope.

When the WBS was developed, a choice was made to break down most of the major tasks on a building by building basis. There were good reasons for this, and we are not recommending that the WBS be changed. However, a WBS that has been developed on a building or location basis makes it more difficult for a project to organize and manage processes that cut across many buildings or locations. For example, PA closure is a major process and achieving PA closure as scheduled is very important to success of the 2006 Closure Plan. However, because this process cuts across many PBDs, WADs, and buildings, it is harder to manage and critical path schedule development for this process is weaker than if the WBS had been done on a major work process basis. Waste Management and Environmental Restoration activities also cut across many PBDs, WADs, and locations.

It appears that K-H and DOE will be required to increase the management attention paid to major processes such as PA closure and Waste Management, to overcome the bias of the WBS towards performing work by location.

#### **4.2.3 Compliance with Rocky Flats Cleanup Agreement (RFCA)**

##### ***Summary***

In validating the overall methodology of the 2006 Rocky Flats Closure Plan (RFCP), it is also necessary to evaluate it against the backdrop of the Rocky Flats Cleanup Agreement (RFCA), which influences many significant aspects of the site closure process. The Rocky Flats Cleanup Agreement (RFCA) is a legally binding agreement between the U.S. Department of Energy, the U.S. Environmental Protection Agency and the Colorado Department of Public Health and Environment that provides fundamental management guidance, a streamlined regulatory framework, and general technical direction designed to enable accelerated closure of RFETS.

While RFCA does not necessarily dictate the incremental detail of site closure activities, cost or schedule, it does provide a framework of regulatory management, technical decision-making and overall closure guidance within the context of the established site closure goals and cleanup end-state. Our evaluation was based on a review of specific key aspects of RFCA wherein activities or other features of the RFCP are streamlined, accelerated, or otherwise facilitated by incorporation or adherence to guidance or protocols contained within RFCA. This provides a

qualitative validation of the overall methodology of the RFCP as structured for application at RFETS.

### *Findings*

Our review indicates that the overall methodology of the RFCP adheres to the general expectations, goals and direction of RFCA, as evidenced by the following:

- The RFCP incorporates key RFCA activities and processes, such as regulatory milestones and target activities, into the overall project schedule and costs bases.
- The RFCP includes a number specific WBS scopes of work, such as the NA/NFA protocol, that encompass RFCA elements targeted at streamlining the overall scope of cleanup work at the Site.
- K-H project management has already utilized other provisions of RFCA to expedite certain cleanup issues or decision processes. DOE, with support from K-H, has used the RFCA dispute resolution protocol. K-H has also participated in the informal dispute process.
- The RFCP integrates the procedural guidance of RFCA for cleanup decision-making by formally incorporating the use of specific Decision Document protocols, including the PAM, IM/IRA, and RSOP, for all applicable Site actions.

Our review also indicates that, although the RFCP methodology incorporates the principal aspects of RFCA, the character of the interaction between RFCA and the 2006 RFCP will change over time. Because the bulk of the major site risk reduction activities, such as removal of SNM and building D&D, have not yet occurred, most of the key elements of RFCA that serve to expedite the regulatory and management environment of the closure process have not yet been fully tested. For this reason, the interaction between RFCA and the RFCP will become increasingly complex as the closure project proceeds, since the potential for impacts and/or changes to the overall closure project will be greater as the more complicated activities are undertaken. This is especially true for late schedule ER activities. Regardless, the fact that the general methodology of the RFCP incorporates key RFCA guidance and procedures provides greater confidence in the ability of the RFCP to achieve the Site's established end-state.

### *Analysis*

The overall intent of the RFCA is to facilitate and enhance the ability of a selected sitewide cleanup strategy to effectively meet the end-state criteria set for the Site. In doing so, RFCA specifically leaves the development and implementation of detailed activity, schedule and cost elements to the cleanup plan itself. In short, RFCA is intended to be an enabling mechanism for the RFCP.

Key to the overall success of RFCA in enabling the accelerated closure of RFETS is the incorporation of key features of RFCA into the overall management and direction of the RFCP. The principal aspects of RFCA reviewed for purposes of this evaluation include the following:

- The streamlined regulatory framework imposed at RFETS by RFCA.
- The regulatory milestones and target activities specifically designated in RFCA.
- RFCA's No Action/No Further Action protocol.
- RFCA's Dispute Resolution process outlined by RFCA.

Each of these aspects and their impact to the RFCP are discussed in the following sections.

### ***Streamlined Regulatory Framework***

RFCA is a crucial closure guidance document for the Site in that it addresses the environmental regulatory process by allowing for the use of more efficient streamlining procedures in order to meet the mandatory legal and administrative requirements of the myriad of regulations that apply to the site. In short, RFCA is intended to avoid delays to onsite response and cleanup actions due to procedural requirements of the regulatory review, permitting, decision and approval processes inherent in the underlying regulatory authorities.

Fundamentally, RFCA establishes a procedural framework and schedule for developing, implementing and monitoring appropriate environmental actions at the Site and ensures that these actions are conducted in accordance with the provisions of applicable regulations, primarily the Comprehensive Environmental Response Compensation and Liability Act (CERCLA or Superfund), the Resource Conservation and Recovery Act (RCRA) and the Colorado Hazardous Waste Act (CHWA). In doing so, RFCA combines reporting and approval activities common to these authorities and sets out specific processes to meet these reporting requirements. The instruments used to accomplish the streamlining of the regulatory process are called "decision documents," and include:

1. **Proposed Action Memorandum (PAM)** – applies to cleanup activities that will be completed during a six-month period.
2. **Interim Measures/ Interim Response Actions (IM/IRA)** – applies to cleanup activities that will be completed over periods in excess of six months.
3. **RFCA Standard Operating Procedures (RSOP)** – are developed for remedial actions or decommissioning activities where the same approach will be applied to several different Individual Hazardous Substance Sites (IHSSs) or buildings. An IM/IRA may be required as part of the first RSOP that is proposed.



Each of these decision documents provide specific elements of the composite regulatory response required of the Site.

The methodology of the RFCP effectively incorporates each of these documents into the overall scope, approach and schedule for the principal activities contained in the integrated schedule. Where applicable, the RFCP also accommodates the cost of developing and accomplishing the requirements of each decision document set within the WBS bases of estimate. This incorporation of the series of RFCA decision documents into the overall procedural concept of the RFCP is a good representation of adherence to the intent and guidance of RFCA in enhancing the accelerated closure of the Site.

K-H project management has also indicated that, in order to further expedite the regulatory process applicable to the site, it is engaged in active discussions with the appropriate regulatory agencies to reduce the total number of decision documents to be developed for specific sets of closure activities. For example, based on the scope of ER activities anticipated for closure, a total of 58 separate sets of decision documents are required. Recognizing that RFCA provides a procedure for combining the regulatory reporting/approval process for actions where the same cleanup approach will be used for several IHSS, K-H has proposed active use of the RSOP process for much of the ER scope of work. This will serve a number of key closure purposes by potentially conserving significant resources in the development of fewer complex document sets, reducing regulatory review time and potentially achieving gains in the tight out-year ER activity schedules.

Although the current Project Baseline Schedule provides for the development of 58 decision document sets, K-H's pursuit of one of RFCA's principal closure streamlining features also reflects the RFCP's sound basis of methodology against the overall goals and intent of RFCA.

### ***Milestones and Target Activities***

Although RFCA does not set a significant number of specific activity dates or deadlines, it does outline a number of regulatory milestones and target activities that the RFCP must achieve. These milestones and target activities generally relate to both project scope and/or schedule, and are based on derived from several bases of

A "milestone" is defined as the date for which a particular event is established in accordance with RFCA. The milestones are divided into: (1) first tier, which are limited to no more than six per fiscal year, and shall reflect end-points for major projects and (2) second tier, that may reflect beginning points for multi-year projects or end-points in addition to those designated as first tier regulatory milestones. The milestones are designed to accomplish the following: (1) provide accountability for key commitments; (2) ensure adequate progress at the site; (3) provide adequate scope drivers; and (4) facilitate budget planning and execution. In essence, the milestones provide key planning and/or implementation set-points against which general site closure progress can be benchmarked.

The 2006 RFCP incorporates all of RFCA milestones and uses these milestones within its overall project planning and schedule development to structure activity sets for detailed schedule allocation and activity progress metrics. This aspect of RFCP methodology is a sound validation of the closure plan against the RFCA, as evidenced by the fact that given the structure and management of activities within the RFCP, only one of nine Regulatory Milestones for 1998 was not met. This milestone was related to the failure of the WIPP facility to open on time, and therefore not directly tied to the integrity of the RFCP itself; this milestone was then deleted with regulatory approval. All 1999 Milestones and Target Activities are reported to be either accomplished or on schedule. To date, the SNM, D&D and ER activities have generally proceeded according to the requirements set in RFCA for on-time accomplishment. Again, the achievement of the regulatory milestones and activities through the RFCP is a sound representation of its validity against RFCA.

#### ***No Action/No Further Action Protocol***

Another significant site closure streamlining function of RFCA is the No Action/No Further Action (NA/NFA) protocol and decision criteria. The ability to consolidate or eliminate specific areas of the site from further investigation and possible remediation has the potential net effect of helping to reduce overall closure scope and cost, accelerating other ER cleanup activities and allowing for the distribution of resources to other ER activities. To date, K-H and DOE have proposed 149 identified historical release sites to the appropriate regulatory authorities for NA/NFA approval. An additional 87 sites have been identified as potential NA/NFA candidates and will likely be submitted for agency review and approval.

These proposed NA/NFA sites were part of a total population of 370 historical release sites identified for purposes of developing the Environmental Restoration scope of work under the 2006 RFCP. Approval of NA/NFA status for the proposed sites effectively reduces the total number of sites conceptually within the ER scope by approximately 40%. In other words, using the RFCA NA/NFA protocol, the ER scope of work to be accomplished for site closure may be significantly reduced and streamlined.

The planning methodology of the RFCP formally integrates the RFCA NA/NFA process in defining the overall scope of site Environmental Restoration work. The RFCP contains a specific WBS within WAD 25 whose fundamental scope is to pursue investigative and characterization activities in order develop information necessary to clarify or support NA/NFA justifications. Although there is some risk that a number of proposed sites may not receive approved NA/NFA status, by incorporating the RFCA NA/NFA protocol into the RFCP process of scope development, the RFCP serves the RFCA goal of streamlining the closure process by supporting the qualification and elimination of unnecessary or irrelevant scope.

The project risk associated with the NA/NFA protocol is related to other elements of RFCA wherein the NA/NFA decisions are subject to revisitation at the time of the geographical

CAD/ROD determination. The NA/NFA decisions are also subject to a mandated five-year review of remedial actions that result in hazardous substances, pollutants, or contaminants remaining at the site. It is conceivable that the NA/NFA status granted for some sites could be revoked due to these reviews, and that cleanup actions could be required in the future, presenting potential schedule and/or cost risks within the current RFCP. However, the RFCP WBS element for pursuing NA/NFA justification activities serves to reduce this potential.

### ***RFCA Dispute Resolution Protocol***

As part of its overall purpose in providing tools and guidance for enabling accelerated closure of the Site, RFCA recognizes that the interactions of many technical and regulatory issues at a complex site can be potential burdens or barriers to progress and cost. In order to assure continued progress toward the Site's closure end-state, RFCA includes provisions for resolution of disputes that may arise during the course of the closure process. These disputes may be related to technical issues, broad closure issues, regulatory matters, or any issue of significant import. The RFCA dispute resolution process is designed to provide a forum for expedited resolution, so that impacts to overall scope, schedule and cost activities are minimized or avoided.

Our review indicates that the RFCA dispute resolution process has been invoked at least once since the advent of the RFCA itself. Although this particular event predates the official implementation of the 2006 RFCP, it indicates that K-H and DOE acknowledge the benefits and utility of the RFCA dispute resolution protocol as it relates to potential issues that may arise during the execution of the RFCP.

A number of future D&D activities and ER cleanup activities will rely on RFCA to enable the site closure to proceed within the proposed closure schedule and estimated budget. In part, these include interim waste storage, onsite treatment, remediation of IHSSs, and underground storage tanks, etc. This review shows that, to the extent possible, appropriate steps have been taken to anticipate and respond to requirements of the RFCA as it relates to these activities.

The true ability of RFCA to facilitate and streamline the scope of regulatory and technical issues will likely be tested more as the peak activities for D&D and ER occur. Within the current RCFP, these areas of the project involve large numbers of activities that are highly sensitive to schedule and resource loading, and occur at key points in the overall closure process. It is likely that issues and decisions made later in the RFCP schedule will be increasingly complex with regard to associated activities and overall impact, and will involve the resolution of highly integrated issues affecting schedule, resource availabilities, the overall site closure end-state, and other technical, regulatory and closure issues. This is particularly true for issues related to soil cleanup levels (including the actinide migration potential), closure cap designs, any unanticipated additional waste storage facilities, pond sediment cleanup requirements, surface water discharge requirements or changes in current regulatory requirements, as these issues affect a wide range of activities within the RFCP.

***Support Documents***

The project documents evaluated for this review are listed below. In addition, interviews were conducted with key personnel within the DOE and K-H that have responsibilities for ensuring the procedures and policies as defined in the Visions and Objectives of RFCA are met.

1. Rocky Flats Cleanup Agreement (RFCA) dated July 19, 1996 (with amendments dated April 16, 1997 and February 26, 1999).
2. Rocky Flats Cleanup Agreement, Appendix 3, RFCA Implementation Guidance Document, Final, July 1998.
3. Action Levels for Radionuclides in Soils for the Rocky Flats Cleanup Agreement, Final, October 31, 1996.
4. Annual Update for the Historical Release Report, RF/RMRS-98-269.UN, September 1998, Revision 0.
5. Rocky Flats Environmental Technology Site, PRO-455-ECATS, Revision 0, Environmental Compliance Action Tracking Systems (ECATS), Effective date October 1, 1998.
6. Closure Plan for Interim Status Units at the Rocky Flats Environmental Technology Site, Draft, February 1998.
7. Quarterly Status Report, RFCA Implementation, RRFETS, Second Quarter, Fiscal Year 1999.
8. Quarterly Status Report, RFCA Implementation, RRFETS, First Quarter, Fiscal Year 1999.
9. Quarterly Status Report, RFCA Implementation, RRFETS, Fourth Quarter, Fiscal Year 1998.
10. Quarterly Status Report, RFCA Implementation, RRFETS, Third Quarter, Fiscal Year 1998.
11. Quarterly Status Report, RFCA Implementation, RRFETS, Second Quarter, Fiscal Year 1998.
12. Quarterly Status Report, RFCA Implementation, RRFETS, First Quarter, Fiscal Year 1998.

#### 4.2.4 Resource Allocation

##### *Objective*

The objective of resource allocation is to close Rocky Flats by the end of calendar year 2006 through the efficient deployment, management and allocation of human resources. Since 1995 there has been a significant effort by K-H and the RFCP team to determine the required fiscal and physical resources to accomplish the timely closure of the facility. The K-H team has completed detailed analysis of the facilities, equipment, processes, regulatory issues and risks associated with the decommissioning and closure of the facility and conversion to other uses acceptable to the public. The process has included mapping out thousands of discrete tasks, budget estimates, assumptions, forecasts, critical path management plan, activity-based models and a risk model. Early in the process it was recognized that a major change of culture would have to occur to affect the successful execution of the project. The project is currently moving from a strategic planning and assessment mode to a project management mode or more appropriate, the focus of the management team has become highly tactical. In as much as the contract between the Department of Energy (DOE) is a Performance Based Integrating Management Contract, it is essential that all resources be deployed effectively to accomplish the goal of closure.

In consideration of the seeming infinite number of variables that can effect the timely execution of the plan, we have attempted to isolate the key areas of concern that impact those most critical aspects of the project and schedule, as it relates to the allocation of human resources to essential project activities.

##### *Assessment Methodology*

Prior to selecting interviewee's, we reviewed the following key documents: Project Management Plan (PMP), Organization Chart, Site Drawings, Expanded Management Schedule (CPM), Milestone Sequence Chart, Milestone Descriptions, Wad/Wadlets, Wad #34 Cluster and BOE's to determine the scope of activities. We have toured the facility, including areas within the Protected Area. Based on the above key individuals on the K-H team were interviewed, these interviews included WAD managers and site maintenance personnel.

Our objective was to understand the current state of the resources available to accomplish activities and tasks versus those resources that will be required to accomplish a new set of activities and tasks, many of which remain undefined and only conceptually documented in the PMP. Through this process, our goal was to attempt to identify gaps in the plan and/or risks that may impact the stated goals of the project. The PMP has accommodated many of these gaps by allocating additional time and expense to cover uncertainties that are difficult, if not impossible to determine due to fact that decommissioning of a nuclear materials processing plant has not been successfully accomplished on a scale of this magnitude.

## Key Findings

The following represents our key findings relative to the Resource Allocations issues that may impact the project schedule in an adverse manner. We have selected these findings due to the impact on a significant portion of the project.

Issues	Potential Adverse Impact
Recruitment of skilled hourly workers.	Impact on safety, costs and K-H managerial resources. Possible schedule delays.
Increased effectiveness of new training programs/communications of lessons learned (knowledge sharing and best practices).	No adverse impact if programs become more effective.
Successful negotiations of Union Agreements: <ol style="list-style-type: none"> <li>1. CBA- United Steel Workers</li> <li>2. PLA - Local Union Contractors</li> </ol>	Negotiations will be occurring during the critical path and have the potential to disrupt the completion of major milestones between the years 2001-2004.
Improved Managerial Practices at the line level during the D&D process: <ol style="list-style-type: none"> <li>1. Supervision</li> <li>2. Performance Evaluations</li> <li>3. Motivational / Behavior Factors</li> </ol>	Improved supervisory skills and work force efficiency are critical success factors that must be achieved over a relatively short time span to assure project success during the early phase of the D&D process.
Retention of "Key" employees: <ol style="list-style-type: none"> <li>1. Hourly</li> <li>2. Salaried</li> <li>3. Contract (Prime Contractors)</li> <li>4. Third Tier Providers</li> </ol>	Loss of "key" employees (hourly and salaried) may impact safety, scheduling and costs. Market conditions are very tight for skilled workers, companies are offering highly competitive wages and benefits packages that will attract the best employees (those most motivated).
Effective Management of Resources: <ol style="list-style-type: none"> <li>1. Planning</li> <li>2. Integration</li> <li>3. Communications</li> <li>4. Controls</li> <li>5. Supervisory</li> </ol>	Ineffective management and decision making at this phase of the project can severely impact the project as D&D work intensifies.
Continued use of proven technology and processes to improve safety, maximize resources and to assure timely closure: <ol style="list-style-type: none"> <li>1. Innovation</li> <li>2. Technological Based Solutions</li> <li>3. Process Improvements</li> </ol>	Unsuccessful integration and management of technology can have a high impact on costs, schedule, resource management and site safety. Poor technology integration can severely impact the project, (i.e., experience with PuSPS).

## Resource Allocation

The effective management of human resources from today through the closure of the Protected Area (PA) is one of the major success factors that will determine if the K-H team was successful in decommissioning and closing the facilities at Rocky Flats. Over the past years, the K-H team has focused its efforts on the development of a comprehensive plan that would encompass the

process and resources necessary to accomplish the task. A task that has no equal in the industry, no comparable benchmarks or defined processes. Consequently, the substance of the plan is in many ways conceptual, likewise resources have been allocated based on assumptions that may or may not be fact based. These estimates have been given risk factors that can significantly increase the requirements if liberally allocated throughout the BOE work estimates.

K-H appears to be at a point in the project where they are able to rationalize the resource requirements, determine needs and more precisely project the needs for specific resources. The continued improvement process if managed on a forward basis should provide an increasingly accurate picture and basis for assumptions.

The recent formation of the Resource Allocation Committee and the reporting methodology being used should provide the information and planning resources required to project resources well in advance of requirements. The resource planning group has become one of the key drivers in how existing resources will be utilized in the future. During the period between 2000 and 2003, the quantity of skilled workers is expected to rise from 113 to a high of 408. These positions will be staffed by existing employees that have been retrained, traded employees from other nuclear sites and new hires.

The prospects for hiring new skilled trades-people will be difficult if the regional economy continues to be as robust as we have seen over the past two years. High employment continued to be a factor in most markets across the nation, especially for workers that have specific skills or are at a journeyman status in the trades. High technology facilities are being constructed at a record breaking pace throughout the nation (expected to exceed a billion dollars in 2000). Denver is one of the hub locations for high technology firms (as seen at the Interlocken Technology Center). The long lead-time required to obtain DOE "Q" clearances and the specialized site training exacerbates this situation. Additional new hire risk is added, due to the drop out rate that occurs during the process period (8-12 months). We understand that efforts are being made to lower clearance requirements for specific areas and that the use of a faster process utilizing the "Triple A" DOE process that requires polygraph testing can reduce this time somewhat. Paperwork used to process new hires continues to be a slow process that inhibits getting the new hire into a productive role, efforts are also underway to streamline the process. We understand that currently there are 12 electrician positions outstanding (this is a critical trade), based on our knowledge of the industry there are few if any experienced electricians available in any of the large metropolitan areas. (K-H advised that, as of September 8, 3 electrician positions are outstanding.) If these trades are critical to meet milestones, every effort should be made to recruit early on to assure their availability.

The six job categories that are needed to staff the PA are the following:

1. Process Specialists
2. D & D Skilled Trades People
3. D & D HRT's (Technicians)
4. Mission Support II's

5. RCT's (Radiological Control Technicians)
6. RRT's (Risk Reduction Technicians)

Re-deployment of existing workers to fill some of these positions will be possible as certain positions are eliminated due to closure activities. Training of these individuals to fill positions, especially the D&D positions will become an important personnel resource. Other efforts are ongoing to recruit qualified nuclear workers from other facilities that can be quickly inducted into the Rocky Flats work force. A comment was made that for every 30 workers that can be recruited, four months can be saved in production time (significant impact). We understand that Human Resources is working on an incentive program to encourage workers at other sites, in other states to relocate on either a long-term basis or temporarily.

Human resources is evaluating and acting on various programs to motivate employees, retain employees and to provide them with a strong sense of commitment from the K-H and DOE team here at Rocky Flats. The success of the retention program for key employees is an area of our concern. It is not unusual or unexpected that in a closure situation, the very best employees (those that are self-actuated, technically skilled and career minded) will seek new opportunities that will challenge them with new experiences and a positive work environment. The closure process of Rocky Flats is a slow, long burn for this type of employee that may be looked at as wasted years versus a growth opportunity. Loss of these employees, their collective experience, leadership and skill, can have a severely negative impact on the closure schedule. Conversely, the other side of the equation is the worker(s) that is not self-actuated, hard to supervise, retrain, and that will become increasingly insecure and focused on the impending closure due to lack of mobility in the market place (an equally important risk to manage and consider).

Although we have been at Rocky Flats for only a short period, we have learned that there are many individuals working on-site that have never worked anywhere else, and in some cases, their children are employed at Rocky Flats. K-H and the prime sub-contractors must be increasingly aware of the psychological state that may exist within the work force, especially those long-term employees. The individuals with limited or specialized job's that may not have equivalents in the market place are particularly susceptible to depression and anxiety. Line supervisors will need to better recognize behavior and performance changes as long-term jobs are eliminated and short-term D&D positions are assigned. Safety and procedures will need to be rigorously enforced as routine jobs performed for years are eliminated and greater demands are placed on workers to make decisions and take independent action in an ever changing work environment.

Resource management will be increasingly complex as priorities are shifted between work areas, buildings and clusters due to changing priorities. The effectiveness of management in communicating change, enforcing process, enhancing worker training and maintaining a high level of work moral will be paramount. We further believe the Resource Allocation Committee will need to carefully deal with all of these issues well in advance to prevent accidents, loss of life or an SNM event that could jeopardize the entire project.

The programs that are just beginning to come together need to be defined, continually evaluated and improved through the critical period between 2000-2004. The ideal objective throughout



this period is to continually improve productivity and meet critical milestones while at the same time, reducing costs in a manner that does not compromise safety or timely closure.

### ***Crafts and Trades (Hourly)***

The major issue that could be viewed as a risk to the plan is the up coming negotiation with the United Steel Workers (USW) in October 2001. The negotiation of the CBA-USW contract comes at a time when D&D work will be in high gear, the work force in flux and many new workers introduced to the work force (approximately 160% increase between 2000 and 2001). Hopefully there will be an adequate supply of newly trained line supervisors to deal with this growing work force and the attendant problems associated with the management of these workers under a less than ideal work environment. Multi-shift activities will also be increased to assure continued progress in shipping materials off-site on a 24x7 basis. It should be expected that there will be an increase in worker issues as the intensity and duration of work increases due to the character of the D&D process (especially in the PA).

The Unions will undoubtedly be seeking hire wages, more benefits, job security, job placement, worker retraining and a host of other demands. Workers and the Union may become increasingly sensitive to the outsourcing of long-term jobs and the simultaneous elimination of the Union positions to non-union businesses (currently allowed by the CBA, 40 position per year). As the date approaches to begin negotiations, a large number of workers may become focused on these issues versus their work. This is a real risk that needs to be planned for in advance.

All the above will represent a major cultural change in the work environment that many of the older employees have become accustomed to. K-H and the major contractors will need to carefully manage through these challenges.

### ***Sub-Contract & Third Tier (Hourly)***

The third tier contractors Project Labor Agreement (PLA) may also be negotiated during a critical period in the RFCP, December 2002. The workers that are represented by this agreement are made up of between 25-30 Union Locals in the Denver area. The work that is performed by these trades is an integral part of the total work force here at Rocky Flats. Although not generally critical to the day-to-day operations, they are required to handle major infrastructure changes, maintenance, specialized systems (e.g., communications, power, HVAC, instrumentation, major construction). As areas become de-classified these trades can take an increasingly larger role in the D&D process, especially after the closure of the Protected Area (PA). The PLA is written to favor the needs of the facility, however, this may change due to the growing business community in the immediate area (Boulder, Louisville and Interlocken). It may be increasingly difficult to obtain quality long-term labor in a market that offers so many other alternatives, especially in clean environments (Sun Micro Systems and other high technology facilities who are willing to pay premiums).

Again, the K-H team will need to plan well in advance to assure that these services and contractors are available and that the assumptions used prior to this point in time remain valid (e.g., man hours, schedules, concurrency issues, costs and sequencing assumptions).

### ***Management and Administration (Salaried)***

The effective management and/or the effectiveness of management in planning, integrating, communicating, controlling and supervision the work at Rocky Flats is the key to the success of the project. All of the preceding comments regarding the work force, the effect of a closure on the work force, job stress and career issues apply to this group. Retention of the key individuals that are adding value daily is important to the success of the project (roughly 10% of the administrative and management work force). This group will also have to deal with the shrinking infrastructure that will be taking place outside of the PA. Communications, services, food services and the like will be disappearing over time, not to mention the buildings people have called their offices for years. Maintaining a functional, efficient and operational environment throughout the closure process will be difficult, require careful planning, communications and outstanding project management skills.

Although not an apparent high risk area, management (the organization) is ultimately responsible for maintaining the structure and integrity of the processes and controls. The work force will continue to require direction and guidance to assure a high level of performance and efficiency through the closure process.

### ***Technology and Process Improvement Methodology***

The tactical use of innovative technology solutions and process improvements can have a significant impact on the outcome of the project. Based on the success of the many projects that have already occurred and plans for others, the use of technology should continue to have positive impact on improved safety, schedules and project costs. Funding for these projects should continue if found to be cost effective or substantially reduce risks. Based on conversations with the Technology Director, the application of technology is restricted to proven technology and not R&D equipment, systems or processes that could introduce new uncertainty risks into the project, (i.e., the PuSPS equipment found in Building 371). Due to the nature of the K-H contract, we expect K-H to aggressively seek methods that can improve efficiencies, while at the same time meet regulatory requirements.

Further application of technology is expected to positively impact the following areas:

- Characterization (instrumentation, data analysis, reporting, more accurately, timelier and less costly).
- Remote controlled tools to accelerate cutting, material handling and processing.
- Processing of "Orphan Projects" that have not been included in the plan but require attention to avoid delays downstream in the D&D process.

- Improved technology to assure post closing site containment (reduce level of public concern).

We expect the use of technology past, present and future will significantly reduce project cost and staffing requirements, compress the closure schedule and provide an added level of safety for the workers and site. The impact of these expected improvements in efficiency is not reflected in the PMP or critical path plans. K-H is expected to make continual improvements as the project progresses and there are valid benchmarks that can be used to project costs on a forward basis. In many cases, application of a technological solution will offset cost over runs elsewhere, however, contributing to cost containment overall.

As innovative technology and methods are introduced it will be increasingly essential to assure adequate training to assure safety, regulatory compliance and productivity within the work place.

K-H should make a concerted effort in cooperation with the DOE to share the techniques and methodologies developed to accelerate the D&D process with other sites throughout the country. This is a project dividend or legacy of RFCP that can have long range benefits to other facilities, personnel safety and cost containment.

### ***Conclusion***

We recommend that the DOE emphasize the implementation and follow through in the areas identified under key findings to assure to the greatest extent possible that major milestones be met. K-H is currently managing many of these issues in a pragmatic manner. Considering the number of variables that can impact the project, this may be the only means to manage for results on a daily basis. However, there are larger issues at risk such as worker safety, stewardship, public accountability, management of resources and regulatory issues that must be considered and maintained to meet the closure goals.

Based upon our review over the past 45 days we have seen many examples indicating numerous disconnects between the plan, budget, schedule and resource management. These disconnects present certain and uncertain risk. The K-H team, at both the highest level of management and planning and operations level must close these gaps, especially in regards to the management, planning and supervision of human resources.

### ***Recommendations***

1. Increase the recruiting effort from all sources to assure the availability of "qualified and skilled" workers when and where required. We are concerned that training of the existing work force to perform highly skilled labor intensive D&D tasks may not be entirely successful. Many of these workers may not be suitable candidates for this type of work and use of them in the FTE count may cause a deficit in the actual recruitment requirements of needed D&D workers. The character of the work and candidate pool should be further analyze not by count, but by ability to successful efficiently perform the work required.

2. In the event labor issues begin to impact scheduling plan alternate strategies and tactics (contingency plan) to assure the pace and momentum of closure as it relates to the Protected Area (critical path). The successful D&D process and closure of this area is essential to meeting the goals of the project and can not be compromised by a protracted negotiation or slow down in worker productivity.
3. Assure that all training programs are in place and executed well in advance of the required activities. Assure the effectiveness of these new training programs prior to full implementation and integration. Primary emphasis on training of line supervisors who will need to communicate new practices, productivity expectations, performance/evaluation measures and cultural changes occurring in a highly dynamic work environment.
4. Due to the tight market conditions for skilled and experienced workers (hourly and salaried) K-H, Safe Site, RMRS and other key contractors need to tactically identify resources and individuals that are necessary to drive the closure process. Retention programs need to be carefully planned, executed and monitored in relation to market conditions and availability of resources.
5. Assure that all management controls and infrastructure are in place to assure the continuity and effectiveness of the planning, integration, communications, controls and supervision process.
6. Continued introduction and application of innovative technology based solutions to assure improve safety, productivity, reduction of both known and uncertain risks associated with the closure of a nuclear facility.

Capitalize on the legacy of the Rocky Flats Closure Project by sharing the methodologies and processes used at Rocky Flats for the closure and/or operational enhancement of other nuclear facilities throughout the United States.



## 4.3 Risk Management

The objective of this section is to review how Kaiser-Hill (K-H) undertakes risk management at the Rocky Flats site and to assess the reasonableness of the Schedule Risk Analysis undertaken. This assessment is based on information contained in the Programmatic Risk Management Plan, Revision 0 dated June 16, 1999, and the Schedule Risk Analysis dated June 30, 1999.

The identification, assessment and management of risk are essential in the effective management and control of projects with the size and complexity of the 2006 Rocky Flats Closure Project. K-H recognizes the importance of risk management and has developed a Programmatic Risk Management Plan, Revision 0 dated June 16, 1999, detailing how risk management principles and techniques have been, and are currently, applied throughout the project. Evidence of quantitative risk management can be found in the various schedules and costs that K-H has so far produced for the project.

Our objective was to assess the reasonableness of the risk management methodology applied by K-H on the 2006 Closure Project by:

- Examining the principles set out in the Programmatic Risk Management Plan
- Reviewing the Schedule Risk Analysis dated June 30, 1999
- Taking into account industry standards and best practice.

In addition to looking at the reasonableness of the methodology, we have also reviewed the application and results of the risk management undertaken within the Schedule Risk Analysis.

We have assessed the reasonableness of the risk management being applied by K-H against current industry standards and best practice as applied to major projects both within and outside the nuclear industry. In the Executive Summary we draw together our main observations of K-H's risk management approach and suggest potential opportunities for improvement in line with industry best practice.

### 4.3.1 Programmatic Risk Management Plan

We have reviewed the Programmatic Risk Scores (Table 1-1) within the Programmatic Risk Management Plan. On the scoring scale of 1 to 5 (score of 1 is low risk; score of 5 is a high risk) there are no scores above 3 for technology, work scope definition and inter-site dependency.

We would comment that on a project of this size and complexity which is still developing on many fronts, a table of risk scores between 1 and 3 (i.e., no high or very high-risk scores) may be misinterpreted. It is possible that a false impression of confidence in the overall position of the project may be generated, especially if this document is read in isolation and not in conjunction with the Schedule Risk Analysis.

In general, the Programmatic Risk Management Plan is a very good document setting out the principles and procedures to be adopted by the K-H team in the application of risk management. However, we believe there is scope for reviewing these principles and procedures and amending them to take into account the following:

- The identification and quantification of risk as well as uncertainty.
- Prioritization of risks to include all project objectives.
- Cost Risk Analysis to include non-schedule costs, risks, uncertainty and mitigation costs.
- Realistic contingency calculation.
- Risk interdependency within quantitative analysis.
- Use of alternative information-gathering techniques.
- The use of external risk management expertise.
- Further development of qualitative risk management tools.
- Opportunities

#### 4.3.2 Schedule Risk Analysis

K-H states in the Summary Risk Information (Section 2.2.1) that they 'calculate a 7% probability for Milestone 99 "Site Closure Complete" to occur by December 2006.' However, K-H also states that the frequency histogram '... illustrates the probability of Milestone 99 "Site Closure Complete" occurring during the period October 2006 and October 2007.'

To summarize, the probability of the project being completed by 2006 is very low but there is a 100% probability that the project will be complete by October 2007. We have serious reservation about the validity and reasonableness of the Schedule Risk Analysis results due to:

- The qualifications stated in the Schedule Risk Analysis concerning Additional Schedule Risk Issues and Elements of Schedule Risk.
- The apparent absence of consistent logic and constraints within the project schedule.
- The use of critical path and near critical path activities only in the quantitative analysis.
- Lack of apparent interdependency relationships within the quantitative analysis.

As K-H have stated:

'... much of the RFETS cleanup work involves processes and technologies never before used on a large scale'

'... the cleanup strategy involves the removal and transfer of contaminated materials to other DOE sites'

'... much of the cleanup work is "first time" work'

The spread of risk included in the above Schedule Risk Analysis results does not appear to reflect these major issues.

#### 4.3.3 Findings and Recommendations

The risk management procedures, systems and analysis produced by K-H to date, as demonstrated by the Programmatic Risk Management Plan and Schedule Risk Analysis, indicate the seriousness and importance that is placed on risk and its management. K-H has developed a comprehensive risk management approach and is applying this within the project.

We recommend that, as part of the ongoing development of K-H's risk management procedures and systems, that the following be incorporated into the risk management approach:

- Risk management workshops, questionnaires, standard list and briefing papers be used in conjunction with interviews to identify and gather risk information.
- Use external risk management expertise to bring in current industry best practice and to supplement the K-H risk management team.
- Structure risk management systems to identify risks as well as uncertainty.
- Investigate how all of the project's objectives can be utilized in the assessment and prioritization of risks.
- Review the methodology behind the Schedule Risk Analysis to assess the impact of 'high risk' activities not on the critical path or near the critical path.
- Ensure that the schedule used within the Schedule Risk Analysis is complete taking on board the comment regarding constraint, logic, etc.
- Review how Cost Risk Analysis is undertaken taking into account schedule and non-schedule related cost, uncertainty, risks, mitigation costs and contingency calculation.
- Review the methodology concerning Contingency Planning; is the 50<sup>th</sup> percentile the most appropriate level to set project schedules and budgets?
- Further develop qualitative risk management procedures as identified and apply within the project.
- Investigate interdependency relationships between risk and apply within the quantitative risk analysis for both schedule and cost.

Finally, risk management is normally applied to identify risk, uncertainty and problems associated with a project (i.e., negative aspect), what can go wrong? By applying the same principles and utilizing the skills and resources available within the risk management team it is possible to look for and identify opportunities (i.e., improvements in the current methodology). Risk management best practice advocates that opportunities, as well as risks, be sought as part of the overall risk management process.



#### 4.3.4 Detailed Review - Programmatic Risk Management Plan

The main objective of the Programmatic Risk Management Plan is to enable the Rocky Flats Closure Project to finish on schedule and at cost. Some Rocky Flats cleanup activities involve technologies that present significant cost and schedule challenges and consequently a dedicated programmatic risk management effort exists to accomplish three functions:

- Programmatic Risks – Provide the K-H Management Team with a systematic method of identifying, prioritizing and mitigating programmatic risk.
- Performance Improvement – Undertake continuous performance improvement based on K-H's "self –benchmarking" process including the application of learning curve principles and the optimization of "project sequencing."
- Contingency Planning – Provide an objective, quantitative basis for calculating and allocating cost and schedule contingency.

The K-H Team originally identified 30 integrated projects (Project Baseline Descriptions - PBDs) that formed the RFETS Closure Project Baseline. Through lifecycle planning efforts to restructure and optimize the Closure Project Baseline the proposed closure date of 2006 has been achieved.

##### *RFETS Projects and Programmatic Risk Scores*

K-H correctly states that each of the PBDs possesses programmatic risk and has undertaken a programmatic scoring exercise to convey the level of cost and schedule uncertainty with each PBD under the following headings:

- Technology
- Works Scope Definition
- Inter-Site Dependency

Each of the 30 PBDs was scored between 1 (low risk) and 5 (high risk) against the above headings. A detailed definition of the Programmatic Risk Score can be found in Appendix D. The table of results within the Programmatic Risk Management Plan states that all the Programmatic Risk Scores against the 30 PBDs are between 1 and 3, that is, they are all low to medium and there are no Programmatic Risk Scores of 4 (high) or 5 (very high).

Although it is stated that the Programmatic Risk Scores provide a "general sense of cost and schedule challenges," and that a quantitative risk exercise would provide more detailed information, these results are potentially misleading. It is possible that by indicating that there are no high, or very high, areas of risk within the 2006 Closure Project a false sense of confidence could be generated.

### ***Risk vs Uncertainty***

It appears within the Programmatic Risk Management Plan that K-H has sought to identify, and subsequently quantify, uncertainty and not risks. Risk is defined as the result of multiplying the likelihood of an event occurring (i.e., its probability) by the consequence that event will have on the project should it occur (i.e., its impact). By contrast uncertainty is defined as an event that will occur; however, the scope of the event (in terms of schedule, cost, technical and/or safety) is unknown.

K-H consistently refers to identifying and assessing uncertainty, particularly in project schedules. Existing activities have been reviewed and assessed within the project schedules for areas of uncertainty and a three-point estimate and quantitative analysis has been undertaken. What K-H do not appear to have undertaken is an exercise to identify potential risks to the project and assessed how these risks will effect the project schedules and project costs.

Risks identified, although not always specific activities or events within the project schedules themselves, need to be addressed within the duration, content and/or sequencing of the existing schedules activities and taken into account when assessing the three-point estimates.

Within Cost Risk Analysis risks can be specifically assessed and quantified taking into account probability and impact. It is unclear from the Programmatic Risk Management Plan whether risk are specifically quantified within any Cost Risk Analysis.

### ***Risk Prioritization***

Schedule risk prioritization is undertaken by conducting a sensitivity analysis on the projects critical path to identify the major activities that influence the project completion date. Similarly, cost risk prioritization is undertaken by conducting a sensitivity analysis on the cost elements that makeup the total project costs to identify the major cost elements that influence the total.

K-H's risk prioritization concentrates on the impact that the risk may have on schedule and/or cost. That is the greater the potential impact the risk may have on the project the higher the prioritization that is placed on the risk. What this method of risk prioritization does not appear to take into account is probability and urgency.

Probability is the likelihood of the risk occurring. A risk may have a major impact on the project should it occur but if its probability is very low should it have a high prioritization? Urgency is when the risk is likely to occur. A risk may have a major impact on the project but if it is not forecast to occur for 5 years should this have a higher prioritization than a medium/high impact risk that is forecast to occur within the next 6 months?

Industry best practice prioritizes risks but assessing the probability, impact and urgency of the risks against not only schedule and cost but also all of the project's objectives.

### ***Cost Risk Analysis***

K-H appears to treat cost as a consequence of schedule and subsequently Cost Risk Analysis as a consequence the Schedule Risk Analysis. Although there is a high degree of correlation between schedule and cost it is good practice to assess each separately. When undertaking a cost risk analysis it is important to identify and quantify:

- All known project costs, schedule related and non-schedule related.
- Areas of uncertainty.
- Specific project risks.
- Mitigation costs.

Unlike schedule risk analysis, where it is often not possible to quantify a specific project risk within the schedule, it is possible within cost risk analysis to specifically quantify risks. This increases the importance of identifying risks, as well as uncertainty, as stated previously. Mitigation costs (i.e., the costs of developing and implementing contingency plan), also need to be included within the cost risk analysis to ascertain the overall project costs.

### ***Cost and Schedule Contingency***

K-H states within the Programmatic Risk Management Plan that Contingency Planning is undertaking using the 50<sup>th</sup> percentile from the quantitative risk analysis. The difference between the current project schedule or cost and the 50<sup>th</sup> percentile from the respective risk analysis forms the contingency.

Standard practice is to set the proposed project schedule or budget at the 50<sup>th</sup> percentile. Contingency is then determined by the difference between the 50<sup>th</sup> and 80<sup>th</sup> (or 90<sup>th</sup>) percentile.

By setting the overall project schedule or budget at the 50<sup>th</sup> percentile there is a 50% chance that the schedule or budget will be exceeded. For funding purposes and overall business management this could have serious consequences as a number of project will exceed the original schedule, or budget, or both.

### ***Continuous Performance Improvement***

K-H states within the Programmatic Risk Management Plan that trend analysis of planned vs actual cost and schedule for key activities will be undertaken. This is essential for implementing a continuous performance improvement program, however, K-H do not identify how this will be undertaken 'on the ground' and what systems and procedures they have in place to accurately record all the information. There is no reference within the Programmatic Risk Management Plan of any Earned Value Management procedures or systems.

### *Learning Curve Benefits*

The Programmatic Risk Management Plan refers to Continuous Performance Improvement and learning curve efficiency. K-H correctly identifies that there are areas of work scope uncertainty, and that as the project progresses the benefits of the lessons learned while undertaking this work can be feed back into the project to improve efficiency of future work. This is a double-edged sword. Yes the lesson learned can be used to improve efficiency but it is our experience that the lesson often learned is that the work is more complex and difficult than originally anticipated and therefore takes longer, and cost more, than originally planned and budgeted for.

### *Quantitative Risk Management*

K-H undertakes quantitative risk management on the project as detailed in Section 3 of the Programmatic Risk Management Plan. However, the Programmatic Risk Management Plan does not appear to address the following quantitative analysis issues:

- Interdependency – how the schedule and/or cost impact of one risk effects the impact of other risks.
- Mitigation/Contingency Plans – how the schedule and/or costs issues associated with the development and implementation of mitigation/contingency plans addressed within the risk analysis.

The probability distribution used by K-H include BetaPERT, triangular, uniform and customized. The beta distribution can be used to model risks where the optimistic and most probable or the most probable and pessimistic estimates are the same. Discrete distributions can be used to model probabilities of risks occurring, along with other ‘What if’ scenarios. By using a combination of Discrete distributions, the Beta distribution and the Uniform distribution, all manner of realistic variances can be modeled.

### *Information Gathering*

K-H adopt interviews as the main means of gathering information for their risk management exercises. Although this is a standard method to gather information, it is only one method and is limited by the ability of the interviewer to probe and ask the “right” questions and the possible individual bias of the interviewee’s responses.

We note that K-H employ existing personnel of the Rocky Flats team as risk management interviewers, after receiving in-house training in risk management and interview techniques. As K-H only appear to use interviews as the means of gathering information the importance of this role is increased. However, by using existing site personnel, who are trained by the site risk management team, there is a possibility that any existing bias that may exist on-site, and/or within the project team, will be compounded. The interviewer is likely to accept the answers and assumption given by the interviewee because they are familiar with the history and background issues that have been ongoing within the project over a period of time, and will not look “outside the box.” In this situation the interviewer is less likely to challenge or further interrogate the

answers, especially if the interviewer and interviewee know each other and work for the same organization. In addition, if the interviewee is not being appropriately challenged and probed by the interviewer there is a tendency for a "soft" interview to occur where issues may be missed or skipped over and the information gathered poor.

It is standard practice to use independent risk management expertise to undertake and oversee the risk management exercise. The main reasons why it is standard practice to use independent risk management expertise are:

- New independent view of the project and its risks.
- Existing internal project politics can be overcome.
- Barriers caused by personal or managerial issues can be overcome.
- Existing assumption can be, and are, challenged.
- Cross-fertilization of ideas, risks and solutions can be brought in from other industries.
- High level of professional expertise and risk management experience will benefit the project

It is standard practice within risk management consultancy to use other techniques, in conjunction with interviews, to gathering information. These included:

- Risk Management workshop
- Questionnaires
- Standard lists
- Briefing papers

By combining a number of different techniques in the gathering information, the more accurate and effective the risk management exercise will be.

### ***Schedule Logic***

The Programmatic Risk management Plan states that the programmatic risk results are dependent upon the work logic ties defined in the project's schedule. The quality of any quantitative risk management analysis is only as good as the base data upon which it is undertaken.

A separate report details our observations and comments on the Project Schedule(s), however, the main point have a serious impact on any quantitative analysis. If activities within the schedule(s) do not have successors, and/or are placed in time using constraints instead of logic, there will be a serious impact upon the quality of the quantitative analysis and the validity of the results will be brought into question.

### ***Qualitative Risk Management***

K-H refers to Programmatic Risk Action Plans and Contingency Plans (as opposed to Contingency Planning referred to above) within the Programmatic Risk Management. Risk management action plans and contingency plans form an essential part of qualitative risk management. At present we have been unable to view any risk management action plans or contingency plans produced by K-H but agree that these need to be developed, maintained and managed at PBD or WAD level (i.e., project level).

In addition to risk management action plans and contingency plans it is standard practice for qualitative risk management to also cover:

- Risk Ownership – who is responsible for the management, implementation and reporting of the risk management action plans. This is the individual within the project team who is responsible for the ongoing management of the risk throughout its life, and not the individual who has developed the action or contingency plan.
- Control Procedures – what project control procedures and systems are in place to ensure that a) the action plan is effectively carried out or b) the contingency plan need to be implemented and subsequently is effectively carried out.
- Residual Risks – consideration of risks and/or uncertainty that arise from the proposed risk management action plan or contingency plan. This includes not only the identification of the major residual risks but an assessment of the their impact on schedule and cost. An effective risk management action plan or contingency plan should not have residual risks greater in impact than the original risk itself.
- Interdependency – an assessment of the relationship between individual risks and how they impact on each other

The use of generic risk registers is standard practice to capture qualitative risk management information. Risk registers are used as a management tool within the project itself and as an information/reporting tool to senior management.

#### **4.3.5 Detailed Review - Schedule Risk Analysis**

In the introduction to the Schedule Risk Analysis K-H state that “much of the RFETS cleanup work involves processes and technologies never before used on a large scale.” In addition they also state that a major component of the cleanup strategy involves the “removal and transfer of contaminated materials to other DOE sites for disposal, processing and/or storage.” It is important to remember these comments when assessing the Schedule Risk Analysis, and K-H’s project risk management in general.

The Schedule Risk Analysis was conducted on the RFETS Closure Project Baseline (2006) between May 21 and June 30, 1999. The key elements of the RFETS risk analysis process were:

**Key Risk Analysis Information Inputs:**

- Project Schedule and Logic: Schedule risk analysis focused on the 566 critical path and near critical path activities within the RFETS Closure Project Baseline (2006).
- Basis of Schedule Estimate: Project planning information, including the level of schedule uncertainty, was gathered through direct, face to face interviews with K-H Project Managers.

**Risk Analysis Standards:**

- Programmatic Risk Categories and Levels: The programmatic risk categories used were Technology, Work Scope Definition and Inter-Site Dependency. Risk levels ranged from 5 (high risk) to 1 (low risk) within the Project Baseline Descriptions (PBD) and Work Authorization Document (WAD). During the interview process programmatic risk were assessed for each PBD.
- Basis of Schedule Estimate: The categories of schedule estimating used by the RFETS project management organization are:
  - Historical performance
  - Industry Standard
  - Project Manager's Forecast
  - Expert Opinion

A detailed description of these categories can be found in Appendix D.

**Summary Risk Information:**

- a) RFETS Site Closure
- K-H state that they calculate a 7% probability for Milestone 99 "Site Closure Complete" to occur by December 2006. Therefore the probability of the project being completed by 2006 is very low.

K-H also state, however, that the frequency histogram illustrates the probability of Milestone 99 "Site Closure Complete" occurring during the period October 2006 and October 2007. Therefore there is a 100% probability that the project will be complete by October 2007.

Taking into account K-H's comments above concerning how processes and technologies never before used on a large scale, this appears to be a very narrow spread of schedule risk.

## b) Additional Schedule Risk Issues

K-H has identified Additional Schedule Risk Issues that need to be taken into account when considering the results of the Schedule Risk Analysis. These issues are:

- Elimination of the 300 Area Closure Cap
- Works Scope Definition
- Work Scope Classified as Level of Effort

Each of these issues has a major potential impact on the results of the Schedule Risk Analysis and give rise to serious reservations concerning the validity of the results.

## c) RFETS Protected Area Closure

K-H has also reported on the probability of achieving the closure of the Protected Area (PA) by October 2002, the date of Milestone 301: PA Closure. (Interestingly the closure of the PA is not on the 'technical' critical path but is on the 'money' critical path).

The result of the risk analysis for the achievement of Milestone 301: PA Closure, based on critical path activities (note this does not near critical path activities), is calculated at 1%. The analysis also shows there is a 50% chance of this milestone being achieved by January 2003 and 100% chance of it being completed by May 2003.

Again, taking into account K-H's comments above concerning how processes and technologies never before been used on a large scale, and the inter-site dependency of transporting waste, this appears to be a very narrow spread of schedule risk.

## d) Elements of Schedule Risk

K-H have identified 5 additional elements of schedule risk that should be noted when considering the risk analysis:

- i) 67% of the critical path duration is based on Expert Opinion or Project Manager's Forecast.
- ii) <1% of the critical path schedule duration is based on Industrial Standard reference information.
- iii) Technology risk present noteworthy challenges within 3 identified work areas.
- iv) Work scope definition risk presents noteworthy challenges within 4 identified work areas.
- v) Inter-site dependency risk presents noteworthy challenges within 3 identified work areas



Each of the above elements has a significant impact on the overall risk analysis and supports our concern regarding the apparent narrow spread of risk indicated for the Site Closure and PA Closure milestones.

### ***Critical Path or Near Critical Path Activities***

K-H states that the Schedule Risk Analysis was based upon critical path and near critical path activities only. From the information we have at present we are unable to ascertain what exactly is meant by the term "near critical path," however, it would appear that the Schedule Risk Analysis is flawed by not taking into account all activities. It is possible (and within a project of this size and complexity, probable) that there are numerous activities that are not on the critical path, or near the critical path, but have a high degree of uncertainty and risk. Although these activities may not currently be on the critical path, or near to it, if the risk or uncertainty occurs they may still have a major impact on the overall schedule.

### ***Schedule Logic***

It is unclear from the Schedule Risk Analysis if the complete, full project schedule has been used for the analysis, or a summary schedule produced. It may be that a summary schedule was produced for critical path and near critical path activities. If a summary version of the whole project schedule has been used for the analysis it is essential that this summary schedule contains the same sequencing, logic and links as the complete, full schedule. If the sequencing, logic and links are not maintained within the summary schedule then the results of the quantitative analysis will be invalidated.

Irrespective of whether the complete, full schedule was used for the Schedule Risk Analysis or a summary schedule, the comments within our main report on project schedule still apply. The quality of any quantitative risk management analysis is only as good as the base data upon which it is undertaken. If activities within the schedule(s) do not successors, and/or are placed in time using constraints instead of logic, this will have a serious impact upon the quality of the risk analysis results and raise questions concerning their validity.

### ***Conclusion***

Uncertainty relates to the durations and resources associated with the "best estimate" or most probable activities. Risk relates to the less probable activities should they occur. Schedule uncertainty and schedule risk management should precede and feed into cost uncertainty and cost risk management.

Schedule uncertainty inherent in the most probable activities in the 2006 Closure Plan has been addressed but in a largely ad-hoc manner. Our review of the updated report issued August 30 does show improvement. However, we noted that little regard has been taken of the cost uncertainty inherent in the most probable activities; a blanket cost contingency has been used instead.

No structured attempt has been made to reflect the consequences of the risks if less probable and generally less favorable activity streams may occur. In other words, K-H has not carried out adequate structured project risk and uncertainty management. This is evidenced by the lack of:

- Risk portfolios
- Risk management plans
- Calculated schedule and cost contingencies at the WAD level
- Contingency management program
- Earned value analysis

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## 4.4 Schedule Review

The following is an outline of the organization of Section 4.4:

Introduction

Summary of 2006 CPB Schedule Significant Concerns

Summary of 2006 CPB Schedule Findings

4.4.1 Methodology for Schedule Development

4.4.2 Critical Differences between 2006 Plan and 2010 Plan

4.4.3 Special Nuclear Materials

4.4.4 D & D for Protected Area Buildings

4.4.4.1 PBD 016 Building 371 Cluster Closure Project

4.4.4.2 PBD 017 Building 707/750 Cluster Closure Project

4.4.4.3 PBD 018 Building 771/774 Cluster Closure Project

4.4.4.4 PBD 019 Building 776/777 Cluster Closure Project

4.4.4.5 PBD 022 Building 779 Cluster Closure Project

4.4.5 Waste Management

4.4.6 Environmental Restoration

4.4.7 Schedule Risks

### *Introduction*

The comments, concerns and recommendations found in Section 4.4 of the report are the result of Ernst & Young's review of those portions of the 2006 Closure Project Baseline (CPB) Schedule we felt were critical to site closure as scheduled in 2006. We did not review all of the 2006 CPB Schedule assumptions, scope and sequence; we reviewed a representative set of the Work Authorization Documents (WADs) within several critical Project Baseline Descriptions (PBDs). The WADs reviewed are summarized in Section 4.4.

The Project documentation reviewed includes:

- Electronic copy of 2006 Closure Plan Baseline (CPB) Schedule (2K62)
- Electronic copy of 2010 CPB Schedule (CPBT)
- Kaiser-Hill Rocky Flats Closure Project Management Plan (PMP)
- Interviews with the associated K-H Planning & Integration staff
- Various PBD-specific scheduling work papers (i.e., sequencing plans, drawings and duration calculations)

Our comments are not all-encompassing as only certain PBD's, WAD's and WBS's were included as part of our review. Also, this review is not to be considered as direction to change the means, methods, sequences, or techniques implemented by K-H nor in any way change the

duties or responsibilities of DOE. We understand that responsibility for the completeness, reasonableness and accuracy of the Project Schedule remains the sole responsibility of K-H.

After reviewing the PMP and the "2006 Critical Path" bar chart, we elected to review the Special Nuclear Material (SNM) operations, five building clusters inside the PA which account for approximately 68 percent of the D&D scope, Waste Management (PBD 002) and Environmental Restoration (PBD 001 and 013). The building clusters inside the PA which we reviewed include 371, 779, 771/774, 776/777 & 707/750. The Environmental Restoration review focused on PBD 001 and 013, and included PBD 014, WAD 25 Industrial Zone Closure Project since the majority of the environmental restoration cost as well as activities of high schedule criticality are within these areas.

Each element of the Schedule Review is divided into four subsections:

1. **Basis and Assumptions:** We reviewed the PBD and WAD Assumptions and Conditions as presented in the PMP to determine if they were current and reasonable.
2. **Scope:** We compared the PBD and WAD scope as outlined in PMP with the 2006 CPB Schedule activities regarding completeness and the project scope organization. Additionally, the Project Baseline Descriptions were correlated with the WBS activities for each of the selected WAD's for scope content and the Expanded Management Summary Schedule (EMSS) milestones were compared and verified to match the 2006 CPB activity nodes dates (Milestones).
3. **Schedule Development:** We reviewed the 2006 CPB Schedule development and technical basis relative to industry standard practices and to K-H Standard 10 – Scheduling. We also reviewed work logic and task sequencing to determine if the plan would provide the desired End State by 2006, and we evaluated logic and sequencing for reasonableness and appropriate level of detail for project integration.
4. **Cost & Resource Loading:** We made a diagnostic check of the cost and resource loading as represented in the P3 2006 CPB Schedule.

A Summary of our significant concerns and findings are listed below; detailed discussion and support for these concerns is included in the subsections of Section 4.4.

#### ***Summary of 2006 CPB Schedule Significant Concerns***

We recognize that K-H has made a major effort to define and schedule a large program with a significant number of unknowns. Many of the tasks that are required to close Rocky Flats have never been done before, so estimating some of the activity durations and determining schedule sequencing have been performed in an environment of significant uncertainty. Even within this environment, however, we believe that improvements can be made to the 2006 CPB Schedule to increase confidence that closure can be achieved in 2006.

Our confidence in the ability of the program described in the Closure Baseline Plan to achieve closure in 2006 is significantly reduced by the following:

1. Many of the most important cost and schedule assumptions in the 2006 CPB are centered on closure of the Protected Area (PA). PA closure is driven by two sequences of events, PuSPS and Shipment. We have concerns with these sequences; they contain manual constraints, lag relationships with positive lags and driving Level of Effort (LOE) activities and it appears that PA Closure activities are not tied to all potentially critical areas. If constraints and lags are removed, additional potentially critical logic ties added, and the driving path of the PuSPS revised from Level of Effort activities to detailed work-related activities the critical path, the project approach, and the PA Closure date may change when the schedule is recalculated. We have the following concerns, discussed in detail in Section 4.4.2:
  - Four of the six "Preparation for PA Closure" predecessor activities have been manually constrained so that they will not slip if predecessor activities slip but will only reflect negative float.
  - "Preparation for PA Closure" appears to be directly logically tied only to Buildings 371/374, 771, 707, and 776/777.
  - The PuSPS driving path to PA Closure is the installation and operation of the PuSPS, processing of SNM Holdup and deactivation of the PuSPS. The driving PuSPS activities appear to be Level of Effort (LOE) type.
  - The Shipment driving path to PA Closure also appears to be mostly comprised of LOE activities. Additionally many of the driving relationships are Finish to Start with a positive lag of 10 to 15 work days.

The items listed above create unidentifiable or unaccounted periods of time within the 2006 CPB Schedule. We recommend that the Schedule be recalculated with the following changes incorporated and that the potentially new critical path be reviewed for accuracy:

- Remove constraints and lags
  - Add potential critical logic ties
  - Revise the driving path of the PuSPS from LOE activities to detailed work related activities
2. It appears that many of the SNM Operations, Waste Management (WM) and Environmental Restoration (ER) LOE activities (including surveillance, maintenance, tech support and operations management) do not contain interface logic with the Building deactivation and decommission activities. For FY99, FY00 and even FY01 we believe that sufficient information is available to show the appropriate interdependency relationship between the support LOE activities and the appropriate deactivation and decommission activities. Without the appropriate interdependency relationships, schedule delay in deactivation and decommission activities would not be realized by WM or ER. We recommend that K-H review the scope and interfaces of this work and make the necessary 2006 CPB Schedule revisions to show the activity interdependencies. For further information see Section 4.4.3.

3. The current process for Waste Management (WM) and planning is accomplished through the Waste Generation, Inventory, and Shipping Forecast published by the Waste & Remediation Operations Group (Appendix C). This document is a compilation of waste forecasts produced by the Waste Generators, updated monthly, published on a quarterly basis, and provided to Waste Management. This Waste Generation, Inventory, and Shipping Forecast (WGISF) is the current WM planning and forecasting mechanism and is separate from the 2006 CPB Schedule. Hence the majority of the schedule activities within PBD 002 Waste Management Project have been incorporated as a LOE and do not appear to reflect interface relationships between the waste generation areas and the appropriate waste management. The WGISF Process appears to be the best approach at this time for the out years. However, for FY99 and FY00 there is sufficient information available from the Waste Generation groups for this WM information to be integrated into the 2006 CPB Schedule. We recommend that the 2006 CPB Schedule be further developed to include this known information. For further information see Section 4.4.5.
4. In response to the lack of WM integration logic, ER created their own WM activities (that are not maintained by WM) for waste treatment and management to represent the interface to the WM effort. Because these activities are not maintained by WM, this presents several problems listed below. For further information, see Section 4.4.5.
  - WM is not responsible for the status of activities added by ER and therefore they may not reflect the accurate WM status.
  - Since there is no interface logic to the actual WM activities, changes to these activities would not translate to the ER activity forecasts, possibly creating schedule delay and resource planning problems.
  - The ER added activity Original Duration (for WM activities) calculations are not from WM and may not be in accordance with WM assumptions, possibly creating problems with schedule and resource coordination and planning.

We recommend that WM and ER coordinate the 2006 CPB Schedule WM activities and ensure that the WM activities accurately reflect the goals of both ER and WM. For further information see Section 4.4.5.

5. The K-H staff has stated that they perform monthly monitoring and quarterly forecast updates of resources to make adjustments in D&D and ER plans necessary to support closure. However, these planning activities are not included in the 2006 CPB schedule D&D and ER activity forecasts. This subsequently impacts WM's ability to accurately forecast, schedule and integrate their activities within the 2006 CPB Schedule. K-H has stated that current waste generation forecasts are generally plus or minus 40% accuracy and as additional historical data becomes available the forecasting will improve.



6. The definition and scope of "D&D" and decommissioning appears to vary across WADS. The following PBD description (portion of) for PBD 016, WBS 1.1.06.02.04, 371/374 Decommissioning, is a direct extract from the K-H Project Management Plan:

*Demolition (emphasis added) includes the demolition of the roof, non-structural and structural components, slabs on grade, foundations or tunnel structures within three (3) feet of surrounding grade and, connecting structures (breezeways, overhead walkways, etc.) of the building/structure undergoing demolition and disposal of clean demolition debris. It also includes the packaging, pre-certification and movement to an identified pickup point; i.e., building loading dock, etc., of contaminated wastes generated during the decommissioning effort.*

"Cluster Decommissioning" appears to translate to demolition in this case. However, earlier in PBD 016 under Section 2.1, Purpose and Justification, decommissioning is defined as follows:

*Decommissioning: Those activities occurring after deactivation including surveillance and maintenance, decontamination, dismantlement of the facilities within the cluster.*

Not only does this create an inconsistency relative to the scope of an activity, but it also creates concern relative to the concurrency of operations, deactivation and decommissioning in close proximity. We recommend that K-H review the 2006 CPB Schedule to ensure that the Activity Descriptions accurately describe the scope of the deactivation and D&D work.

7. In the Building Clusters we reviewed the Milestone for "Complete CATI/II Holdup Removal/Close MAA" is typically forecast months prior to the forecast completion of the initial physical deactivation. This creates a potential concern of closing the MAA when an unacceptable amount of SNM remains in the building. We also note that DOE's approval/involvement is not clearly identified for the MAA Closure; this appears to be an approval activity that should be explicitly identified in the schedule so it can be planned for and monitored. We recommend that K-H confirm that their assumptions for MAA closure are in accordance with DOE guidelines and that activities be added to the 2006 CPB Schedule for DOE's approval/involvement.
8. The 2006 CPB Schedule notes that the Completion of SNM Stabilization and Packaging Complete is forecast for June 28, 2002, and there is an Activity (D1QSNMA100 Evaluation of Method for SNM Removal after PuSPS) to address the processing of these materials subsequent to the closure of the PuSPS. However, the post PuSPS stabilization does not begin until FY03. It is not clear how SNM found in FY01 will be stored or processed. We note that DOE's approval/involvement is not clearly identified for the alternative SNM processing method activities. We recommend that K-H review the SNM Removal activities and process as reflected in the 2006 CPB Schedule and confirm they are in accordance with DOE guidelines. We also recommend that activities be added to the 2006 CPB Schedule for DOE's approval/involvement.
9. It is standard scheduling practice to allow schedule logic to drive the activity forecasts as opposed to imposing dates, events or activities in the schedule other than contractual

commitments or milestones. Several important activities have manually constrained early start dates thereby forcing the forecast dates to the identified date and not allowing the predecessor activity logic to drive the sequence. This potentially means that the schedule is artificially manipulated as opposed to being calculated from the activity durations and assigned logic. The addition of unexplained or preferential constraints to the CPM Schedule may produce a biased critical path.

We note that the K-H Standard 10 – Scheduling states the following. However, we believe that in some cases they have deviated too far from a technical development of the CPM schedule.

*P&I will provide scheduling assistance to the Project in creating a CPM which represents the plan of execution, while allowing the Project to focus efforts on planning and scheduling the work scope with decreased emphasis on the correct technical development of a CPM. (emphasis added)*

10. The K-H Standard 17 – Schedule Integration states:

*Subcontractor working schedules shall tie directly to the CPB sub-project schedules.*

We have requested copies of the Subcontract working schedules for several of the PBDs from K-H, but we have only received a portion of the WAD 13 PuSPS schedule. We noted that the WAD 13 Subcontractor schedule did not correlate with the 2006 CPB schedule dates for PuSPS Decontamination and Decommissioning, although the PuSPS operation start forecasts did match. When we interviewed K-H staff, we received varying responses as to whether the Subcontractor working schedules tied directly to the 2006 CPB Schedule. While some matched, others didn't tie due to reported progress or changes in the 2006 CPB Schedule. This could cause a problem in the coordination of the actual work with the expected work indicated in the 2006 CPB Schedule, leaving open the possibility for resource problems and sequencing issues that could affect the schedule and/or safety. For further information see Section 4.4.3. We recommend that K-H review the inconsistencies between the subcontractor schedules and the 2006 CPB Schedule and make the necessary changes to align the two forecasts.

11. There are work activities that are constrained to start months (and years in some cases) after the completion of the predecessor activities. Based on conversations with K-H, such constraints are often due to assumed lack of resources or funding. However, this explanation has not been identified in the documentation reviewed. We recommend that the causes of the constraints be identified and that the necessary revisions be made to the 2006 CPB Schedule.
12. There are Milestone activities that are constrained to finish months (and years in some cases) after the completion of the predecessor activities. We recognize that the lag may be in accordance with K-H Standard 10 – Scheduling to allow completion of Milestones with a decreased level of risk. However, in some cases the lag appears excessive relative to the Standard's contingency guidelines of 30% confidence level or 10% of the project's duration. We recommend that these constraints be reviewed for conformance with Standard 10 and any necessary revisions be made to the 2006 CPB Schedule.

13. The 2006 CPB Schedule does not appear to consistently reflect relationships identifying the transfer of waste operations between buildings, creating potential coordination of resources and forecast problems between buildings. We recommend that the relationships of the transfers between buildings be further developed.
14. The basis for the work day is not defined within the 2006 CPB Schedule but is mostly defined in the PBDs. It is not clear whether the standard is based on an 8-hour day and 40-hour week or more. There also appears to be inconsistencies between the Basis of Estimate, the 2006 CPB Schedule and the PBDs relative to the number of shifts on which an activity is based. This could lead to resource planning problems. We recommend that K-H better clarify within 2006 CPB Schedule the number of shifts required for activities.
15. There are many activities within the 2006 CPB Schedule where the Budgeted Costs appear to be under-estimated, assuming the activity's Original Duration represents a continuous work effort. This is illustrated by calculating the Average Daily Cost of such activities. Additionally, there are activities where the Original Duration is greater than zero and there is no assigned Budgeted Cost. Other activities have similar descriptions, identical Original Durations, but different Budgeted Costs. We recommend that the resources and/or durations be reviewed for accuracy and that any necessary changes be made to the 2006 CPB Schedule.

#### ***Summary of 2006 CPB Schedule Findings***

The Findings discussed below are secondary issues to the Concerns that are discussed in our review, but are also items which should be addressed by K-H to increase our overall confidence in the 2006 CPB Schedule. We recommend that K-H review the following Findings and incorporate the necessary modifications into the 2006 CPB Schedule.

1. Operating procedures within K-H Planning and Integration (P&I) are governed by several standards and instructions that cover all areas of P&I's responsibilities, such as change control, validation, cost estimating, and scheduling. Following are a few excerpts from the K-H Standard 10 – Scheduling which the 2006 CPB Schedule does not appear to consistently address:
  - A. *Activity Durations/Level of Detail.* *Current FY activities and FY+1 activities will generally be two working weeks to three months in duration, except for procurement, regulatory actions, or level-of-effort activities, which do not have intermediate points for performance measurement. Longer term durations for true level-of-effort activities are permissible. Activities scheduled from FY+2 through completion will have durations reflecting the level of scope development.*

As explained in Section 4.4, there are numerous FY and Fy+1 activities other than LOE activities that exceed 60 work days in the 2006 CPB Schedule.

1. *Activities will be divided so that execution is the responsibility of only one organization with a named responsible party, and so that performance may be measured for evaluation and forecasting deficiencies to allow corrective actions to be taken.*

As explained in Section 4.4, there are activities that combine responsibilities (i.e., develop and approve) in the 2006 CPB Schedule.

2. *The scope of each activity will be sufficiently defined to allow activity logic to show interdependencies between responsible organizations, project phases, performance milestones, decision points, and regulatory interfaces.*

The scope of a schedule activity is many times not clearly defined by the activity description itself. One example is "Set 6, Fluorination Area." From the activity description alone it can not be determined if this activity is for deactivation, decommissioning, or dismantlement. The WBS is decommissioning so that in combination with the activity description the intended scope is partially defined. Furthermore, the PBD must be read to understand the work included for decommissioning. The WBS definitions do not appear to be consistent between PBDs.

3. *Activities must allow integration between projects using finish-to-start relationships.*

The 2006 CPB Schedule includes many other relationships such as start-to-start with lags. In some cases the lags are greater than the duration of the tied activities, which indicates a gap of undefined time. Standard scheduling practice would insert an additional activity for the gap and apply a more standard or reasonable relationship.

2. Following are a few excerpts from the K-H Standard 17 – Schedule Integration which the 2006 CPB Schedule does not appear to consistently address:

A. *The Expanded Management Summary Schedule (EMSS) shall tie to the CPB.*

1. *The CPB shall be maintained under P&I configuration control.*
2. *The EMSS and CPB shall reflect the approved 'Focus on Closure' plan case.*
3. *All summary activities represented on the EMSS shall tie to activity nodes in the CPB.*
4. *All RFCP milestones (Site-wide Integrated Safety Management Plan (SISMP), Rocky Flats Cleanup Agreement (RFCA), PAA, and Performance Measures) shall be uniquely identified, and traceable between the EMSS and CPB schedule.*
5. *The EMSS and CPB shall reflect the RFCP strategy identified in the RFCP Project Management Plan.*
6. *The CPB schedules shall identify all on-site interfaces necessary to ensure no internal resource constraints.*

The EMSS appears to generally manually tie to the 2006 CPB Schedule in the sense that the CPB is developed in Primavera Project Planner and the EMSS schedule appears to be developed in a graphics program which requires the manual transfer of information

between programs. The CPB Schedule does not appear to identify many logic interfaces which may drive resource availability and there are several start constraints which K-H has stated may be attributed to resource shortages.

*B. Individual sub-projects contained in the CPB shall identify a logical critical path.*

The sub-projects or WBSs within the 2006 CPB may not exhibit a true or logical critical path due to the manual constraints on activities.

3. The overall schedule philosophy of the planning and characterization in the Technical Strategy of the Remediation PBD states:

*Because of the complexity of the remediation tasks in the Industrial Area, the general rule is that one year is required for the planning and characterization process (planning documents, agency review and approval, sampling, data analysis) and one year is required for remediation (subcontractor procurement, mob/demob, field construction, confirmatory sampling, data analysis, closeout reporting). Because the 2006 closure strategy significantly compresses the schedule, the remediation schedule becomes compressed as well, and is especially dependent on the progress of D&D activities. To address the D&D issue, the general strategy is to initiate characterization during the last year of D&D for those D&D dependent IHHS/PAC/UBC's and begin remediation immediately following completion of D&D.*

This process is reflected in the 2006 CPB baseline schedule through a series of negative lag logic ties between D&D and ER activity groups. K-H P&I has incorporated the negative lag relationships (lag value is the amount of time K-H requires for Planning prior to D&D) to start the planning process before the start of D&D per their technical strategy. Had they incorporated an activity, date constraint or tied their efforts to another group of activities a slip in D&D would not have been indicated in the ER Planning and Characterization process. This is the effect that K-H wants to achieve with this relationship. However uncharacteristic this technique may be from an industry standard scheduling practices, this is a reasonable approach for the desired K-H effect.

4. There are instances where the basis for the reported acceleration between the 2010 and the 2006 CPB Schedule cannot be determined with the available information. Specific cases usually have a manually constrained 2010 CPB Schedule Milestone with no or LOE predecessor activities and reflect additional activity and logic detail in the 2006 CPB Schedule. (The B707 Consolidation Milestone appears to have been accelerated by over two years but the 2010 CPB Schedule Activity B0SMILE252, B707 Consolidation Of Packaged Residues Complete was manually constrained to finish May 30, 2002 and is now driven by schedule predecessor logic (to the Removal or eU Hemishells) in the 2006 CPB Schedule).

5. There are four calendars identified with the following holidays:

Calendar	Identified Holidays	Number of Activities on Calendar
1 - 5 Day with holidays	New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas	8,253
2 - AWS/Holiday	Every other Friday and New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas	4,063
A - 7 Day with no holidays	None	356
B - 6 Day with no holidays	None	5

Other typical government holidays not reflected in the 2006 CPB Schedule include: President's Day, Martin Luther King Day, Columbus Day, Veterans Day. We have not confirmed if the included holidays are in line with current union agreements and DOE's policy. This creates the potential for schedule inaccuracies and resource problems.

6. The process for Subcontractor procurement is not consistently reflected in the 2006 CPB Schedule.
7. There are activity strings in the 2006 CPB Schedule that do not appear to reflect reasonable construction sequencing such as Activity D301298670, Demo Bldg 780, precedes activities that provide for Stripout, Engineering Surveying, etc. Additionally, there are activity strings where the driving relationships appear to be unrelated to work tasks. For example, in WBS 1.1.06.14.04.01, Bldg 727 Decommissioning, 779 Cluster, Activity D309009000, B727 Stripout, is driven by Activity D309007140, Demolition of B779. It is unclear from the information presented what links activities in one building to those on other buildings.
8. There are occurrences where the decommissioning scope is inconsistent as represented by the 2006 CPB Schedule activities. For example, WBS 1.1.06.02.04.04, Building 374 Decommissioning, 371/374 Cluster, does not include any planning & engineering, characterization, project management, support services, site prep, or decontamination activities for Set 7 and other sets have activities that appear to cover this scope.
9. The basis for the Facility Disposition Cost Model is reported to be the Revision 7 of the 2006 Level - Resource Leveled/Unconstrained Funding/Planning in the Year Prior to Decommissioning/Associated ER Actions Incorporated chart ("Eye Chart"). The 2006 CPB P3 schedule includes activities that do not coincide with the Eye Chart.
10. Many activities in the 2006 CPB Schedule were significantly shortened in duration from what they were previously in the 2010 CPB. In some cases, the activity duration was decreased by more than half. For example, in WBS 1.1.06.13.03.02, 778 Cluster Deactivation Planning and Project Management, Activity D2B001303A, B778 Cluster Deactivation, had an Original Duration of 12 months in the 2010 CPB and currently reflects a decreased Original Duration of three months in the 2006 CPB Schedule. The basis for the shortened Original Duration is not known which causes concern relative to deleted scope.

11. The definition of the end state for "Cluster Closure" varies between WBSs and whether the scope should include Environmental Remediation/Restoration (ER). WBS 1.1.06.04.AA, Decommissioning Project Management, included ER in the 2010 CPB Schedule but not in the 2006 CPB Schedule. Other WBSs in the 2006 CPB Schedule appear to include ER within the "Cluster Closure" scope. The variance in the definition or scope included by "Cluster Closure" causes concern relative to deleted scope.
12. There are numerous activities in the 2010 CPB Schedule that were deleted in the 2006 CPB Schedule. The scope in the deleted items could not be accounted for in the 2006 CPB Schedule. For example, Activity A9E12CN226, Cooling Tower Replacement, Const. FY00, was deleted from the 2010 CPB to the 2006 CPB Schedule and the scope did not appear to be included in any of the 2006 CPB Schedule activities. The basis for the deleted scope is not known which causes concern relative to deleted scope.
13. Several 2006 CPB Schedule activities indicate significant change to the Budgeted Cost from the 2010 CPB Schedule while the Original Duration remained the same. See below. It is not clear what caused the increase.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float	2006 CPB Budgeted Cost	2010 CPB Budgeted Cost
D4R0501A00	B771 New/Revised Author. Basis FY2001	227	2-Oct-00	27-Sep-01	167	\$588,000.00	\$39,879.45

14. There are conflicts between the P3 2006 CPB Schedule and the technical documentation in the PBDs. For Building Cluster 776, the PBD states that beginning in FY01, the work scope includes two work shifts and a third shift for maintenance. The resource loading in P3 does not appear to reflect the increase in manpower which may result in a resource planning problem.
15. In WAD 005 – TRU/TRM Construction Project, A5EC432160, Achieve Beneficial Occupancy for B440 Staging Module, the 2006 CPB Schedule Milestone has been accelerated by approximately 17 months as a result of the removal of the B440 Shipping Module Construction scope that was part of the 2010 CPB Schedule.
16. The SAP Preparation and SAP Approvals reflect no Agency Review cycle. K-H P&I has stated that this effort is included in the SAP Preparation activity duration of 40 days. A review of the ER templates for SAP, show that the Sample Plan Analysis Prep duration includes the Plan Preparation, Reviews, and Comment Incorporation. K-H's Standard indicates activities with differing work scope and/or responsibilities are to be scheduled as separate activities.

The following Table summarizes the portions of the 2006 CPB Schedule our team reviewed to develop this report.

WAD #	WAD Description	2006 CPB Schedule WAD Reviewed	2006 CPB Schedule WAD Budget Cost	2006 CPB Schedule WAD Budget Cost Reviewed
WAD 001	Buffer Zone Misc Clusters Project	PORTION	\$80,813,613	\$30,171,550
WAD 002	Sanitary Waste Project	YES	\$28,270,521	\$28,270,521
WAD 003	LLW / LLMW Construction Project		No Associated Costs	0
WAD 004	TRU / TRUM Project	YES	\$167,893,361	\$167,893,361
WAD 005	TRU / TRUM Construction Project	YES	\$17,046,388	\$17,046,388
WAD 006	Waste Disposal Project ( Non-TRU )	YES	\$228,355,834	\$228,355,834
WAD 007	Waste Treatment Project	YES	\$25,575,651	\$25,575,651
WAD 008	WM Support Project		No Associated Costs	0
WAD 009	B371 94-3 Safety Upgrade Project	YES	\$2,655,960	\$2,655,960
WAD 010	Pu Storage Project	YES	\$2,447,146	\$2,447,146
WAD 011	Pu Facility Construction Project		Inactive	0
WAD 012	SNM Support Project		Inactive	0
WAD 013	Pu Processing & Packaging Project	YES	\$41,865,429	\$41,865,429
WAD 014	NDA Program	YES	\$40,644,272	\$40,644,272
WAD 015	Salt Stabilization Project	YES	\$18,141,631	\$18,141,631
WAD 016	SNM Liquid Stab Development Project		Complete	0
WAD 017	Uranium Decontamination Project		\$894,801	0
WAD 018	HEUN Project		Complete	0
WAD 019	B371 Liquid Stabilization Project	YES	\$4,802,933	\$4,802,933
WAD 020	Dry Repack Residue Elimination Project	YES	\$22,803,473	\$22,803,473
WAD 021	B707 SNM Size Reduction & Stab		\$3,273,400	0
WAD 022	SNM Shipping Project	YES	\$31,098,963	\$31,098,963
WAD 023	Closure Cap Project	PORTION	\$27,911,087	\$8,138,648
WAD 024	Environmental Compliance Project		\$46,213,536	0
WAD 025	Industrial Zone Clusters Project	PORTION	\$142,926,987	\$19,445,622
WAD 026	207 Cluster Project		Inactive	0
WAD 027	559 / 790 Cluster Project		\$38,086,908	0
WAD 028	700 Cluster Project		Inactive	0
WAD 029	800 Cluster Project		\$17,005,651	0
WAD 030	900 Cluster Project		Inactive	0
WAD 031	371 Cluster Project	YES	\$212,866,627	\$212,866,627
WAD 032	707 / 750 Cluster Project	YES	\$188,372,808	\$188,372,808
WAD 033	779 Cluster Project	YES	\$44,027,426	\$44,027,426
WAD 034	771 / 774 Cluster Project	YES	\$147,546,755	\$147,546,755
WAD 035	776 / 777 Cluster Project	YES	\$176,282,209	\$176,282,209
WAD 036	881 Cluster Project		\$126,791,576	0
WAD 037	991 Cluster Project		\$30,857,299	0
WAD 038	566 / SECNPZ / 790 / 800A Cluster Proj		\$8,220,384	0
WAD 039	Utilities Project		\$14,662,520	0
WAD 040	Infrastructure Project		\$212,705,112	0
WAD 041	Analytical Services Project		\$43,058,695	0
WAD 042	Infrastructure Capital / GPP Project		No Associated Costs	0
WAD 043	UST Project		No Associated Costs	0
WAD 044	Management Project		\$438,238,022	0
WAD 045	Program Support Project		\$142,074,702	0
WAD 046	Technical Support Project		\$127,407,228	0
WAD 047	Sewage Treatment Project		No Associated Costs	0
WAD 048	Liquid Waste Treatment Upgrades	YES	\$10,381,551	\$10,381,551
WAD 049	CTMP Project		No Associated Costs	0
WAD 050	Contaminant Removal Project		No Associated Costs	0
WAD 051	Health Physics / Representative Effluent		\$81,000	0
WAD 052	Infrastructure Replacement Project		No Associated Costs	0
WAD 053	ES&H Enhancement Project		\$165,346	0
WAD 054	Plant Fire Security System Project		\$13,827,973	0
WAD 055	Criticality Alarms Project		\$3,814,613	0
WAD 056	Future Closure Construction Projects		Inactive	0
WAD 057	Work For Other Projects		Work not included in 2006 CPB	0



WAD #	WAD Description	2006 CPB Schedule WAD Reviewed	2006 CPB Schedule WAD Budget Cost	2006 CPB Schedule WAD Budget Cost Reviewed
WAD 058	Accounting Transactions		No Associated Costs	0
WAD 059	IAEA Project	YES	\$545,648	\$545,648
WAD 060	Safeguards & Security Op Project		\$133,431,352	0
WAD 061	PASS Project		Inactive	0
WAD 062	LLW / LLMW Storage Project	YES	\$90,713,418	\$90,713,418
WAD 063	Cost Reduction Proposal		\$300,693,432	0
WAD 064	125 / 441, 444, 690T Cluster Project		\$86,274,479	0
WAD 065	903 / 905, H20GIZ Cluster Project		Inactive	0
WAD 066	INFSEW Cluster Project		\$11,354,323	0
WAD 067	440 / 664 Cluster Project		\$22,963,433	0
WAD 068	750HAZ / 904 / 906 Cluster Project		\$7,632,545	0
WAD 069	PWTS Cluster Project		Inactive	0
WAD 070	569 Cluster Project		\$4,611,560	0
WAD 071	910 / PWSTN Cluster Project		\$2,677,192	0
WAD 072	980 Cluster Project		Inactive	0
WAD 074	750 PAD Cluster Project	YES	\$2,987,480	\$2,987,480
WAD 075	750 Cluster Project	YES	\$8,823,945	\$8,823,945
WAD 076	771 / 774 Remediation Project	YES	\$5,742,871	\$5,742,871
WAD 077	207 / 964 Cluster Project		\$15,817,679	0
WAD 080	Incentive Fee		Inactive	0
WAD 083	Buffer Zone Environmental Remediation	PORTION	\$87,039,075	\$54,482,196
WAD 084	Occupational Health Support Project		Inactive	0
WAD 085	Workforce Restructuring		\$83,903,921	0
WAD 086	Off-Site Work for RFFO		Inactive	0
WAD 087	Fringe Benefits		\$499,502,330	0
WAD 088	Ash Stabilization Project		\$15,675,033	0
WAD 089	B371 Residues Elimination Project	YES	\$25,640,314	\$25,640,314
WAD 090	Residue Program Support Project	YES	\$53,569,630	\$53,569,630
WAD 091	B771 / 774 Bottle Box Operations	YES	\$216,898	\$216,898
WAD 092	371 / 374 Cluster SNM Removal Op		Inactive	0
WAD 093	707 Cluster SNM Removal Operations		Inactive	0
WAD 094	771 / 774 Cluster SNM Removal Op		Inactive	0
WAD 095	776 / 777 Cluster SNM Removal Op		Inactive	0
WAD 096	Suspense Costs		Inactive	0
WAD 097	Fixed Price Support Contract Cost		Inactive	0
WAD 098	Legacy Costs		Inactive	0
<b>Total</b>			<b>\$4,389,925,946 (100%)</b>	<b>\$1,692,130,982 (39%)</b>

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#### 4.4.1 Methodology for Schedule Development

Ernst & Young (E&Y) interviewed various members of Kaiser-Hill's (K-H) staff in order to better understand the methodology applied to develop the 2006 Closure Plan Baseline (CPB) Schedule. Understanding how the contractor developed the schedule enabled us to focus our review of the 2006 CPB Schedule and allows us to deliver more substantive feedback. The following summarizes the 2006 CPB Schedule development methodology as it was explained by K-H.

The 2006 CPB Schedule is the culmination of three previous closure schedules. When K-H was awarded the contract in 1995, the managers, analysts, and schedulers developed a high level, "top down" type of schedule called the Accelerated Site Action Plan (ASAP) that had incorporated approximately 1,600 schedule activities. Many, if not most, of these activities were single line items for large areas of work, but this cumulative schedule represented a baseline of the overall scope of work to achieve site closure by 2010.

The next schedule developed was the Life Cycle Baseline (LCB) schedule. This schedule included approximately 17,000 activities and provided a greater level of detail for the scope of work to achieve site closure. The LCB began to develop individual work plans for each building and the SNM removal process. This schedule was resource loaded and provided K-H with the information they needed to project staffing and personnel requirements as well as funding needs.

The LCB was then used by K-H and the four primary contractors on site (often referred to as the "Four Tops") to develop the 2010 Closure Plan Baseline (CPB) Schedule in late 1997 and early 1998. The 2010 CPB Schedule which was developed in Primavera Project Planner (P3) had approximately 27,000 activities at the time it was first published. In this schedule, K-H attempted to fully integrate all of the ongoing Special Nuclear Material operation programs with the activities required to achieve site closure. The organizational structure elements of the 2010 CPB Schedule are the Project Baseline Descriptions (PBDs), which are broken down into Work Authorization Documents (WADs), containing WADlets or Work Breakdown Structures (WBSs). The WADs and WADlets represent the individual projects that must be executed to achieve site closure and contain the individual activities that the contractor(s) will perform on a daily basis. This 2010 CPB Schedule was a detailed "bottom up" type schedule that was developed at the WAD and WADlet levels and "rolled up" to a summary level scope of work as documented in the PBDs. The 2010 CPB Schedule development began with the PBD managers, WAD managers, analysts and schedulers identifying the activities that were required to complete each Building Cluster Project and operational mission. These activities were then given durations by using a template of "quantity of work" based assumptions developed by K-H. Each quantity-based assumption was reviewed by a Subject Matter Expert (SME) for its appropriateness for each individual room or work area and subsequently the activity durations were modified to reflect the input of the SME.

As each WADlet and WAD was developed through the process noted above, the resources were entered into K-H estimating program Basis of Estimate Tool (BEST), which is part of K-H's project management software called Joshua. BEST then used this information to develop a cost

of the work for each activity within each WAD or WADlet. K-H indicated, as part of their fully integrated schedule, that every schedule activity has a corresponding item in the BEST program. These costs and resources were then downloaded back into the 2010 CPB Schedule. Concurrent with the loading of resources into BEST, the resource information was used to calculate the activity durations independent of BEST and P3. Some analysts have developed Excel spread sheets to calculate activity durations. However, this task does not appear to be consistent across the project nor are the productivity rates applied to calculate durations clearly documented in any of these management systems. P3 then spreads the costs and resources over the scheduled activities. However, P3 was not used to manage non-skilled resources, only to manage resources for Critical Skill Analysis (i.e., the hiring and training of personnel with SNM skills), and to provide a forecast over time. This cost and resource flow information is then downloaded back into the Joshua project management system and into a program called PIRS (Planning and Integration Reporting System).

The procedures listed above are still in use and were used in developing the 2006 CPB Schedule. The 2006 CPB Schedule is a revision to the 2010 CPB Schedule that has been accelerated in order to achieve site closure by 2006 instead of 2010. K-H has stated that the bulk of accelerated activities are focused in the Decontamination and Decommissioning areas. Additionally, the organizational structure of the 2006 CPB Schedule remains largely unchanged from the 2010 CPB, and K-H has begun to apply the "Rolling Wave" development methodology in accordance with K-H's Standard 10 – Scheduling. K-H's Standard Rolling Wave methodology requires that the current fiscal year and the next fiscal year be the most developed in detail and that the out years may reflect a lower level of detail. It has also been K-H's policy to remove/archive all completed activities from the schedule at the end of a fiscal year in order to better manage the size of the schedule as it increases its level of detail through time. K-H indicated that this practice of archiving previous years would no longer be done starting with this fiscal year, 1999.

In addition to the P3 2006 CPB Schedule the following schedules also exist and are used for different purposes:

Schedule Document	Use
2006 Management Summary Schedule (MSS) – Revision 2.0	Presentation Tool
2006 Expanded Management Summary Schedule (EMSS) – Revision 2.0	Communication, integration, and Quality control/validation Tool
2006 Critical Path	Presentation Tool
Milestone Sequence Chart Revision 2.0	Presentation Tool
Rev. 7 (1/26/99) Baseline Resource Leveled/Unconstrained Funding/Planning In The Year Prior To Decommissioning/ Associated ER Activities Incorporated chart ("Eye-chart")	Basis for Facility Disposition Cost Model

The above schedules are manually extracted from the P3 2006 CPB Schedule and should conform to the configuration controlled CPB except when displaying leading information to guide CPB development to be in accordance with the K-H's Standard. In some cases the basis for the forecasts shown in the "Eye-Chart" cannot be found in the P3 2006 CPB Schedule or the

forecasts do not match the P3 version. Specific inconsistencies are outlined in Section 4.4 of this report.

The K-H Standard 10 – Scheduling also indicates the guidelines that should be followed in the development of the schedule and who is those responsible for the various aspects of the schedule. K-H Planning & Integration (P&I) designates a CPB scheduler to assist the Project Manager's representative with developing, updating, and maintaining the 2006 CPB Schedule. The following is an excerpt from Standard 10 regarding schedule development.

*P&I will provide scheduling assistance to the Project in creating a CPM which represents the plan of execution, while allowing the Project to focus efforts on planning and scheduling the work scope with decreased emphasis on the correct technical development of a CPM.*

The Standard 17 Schedule Integration continues to state that the Site critical path shall represent a feasible plan, constrained by assumed levels of annual funding and since it is a resource constrained path; it is not the mathematical critical path through the overall project. The intent of developing a critical path method (CPM) schedule is to develop an integrated time time-phased plan to achieve the goals of the project. As the project progresses, the CPM schedule is updated to reflect the progress and events to date. When properly developed with appropriate logic, the CPM allows the project management team to foresee potential critical issues in time to address them before the project is impacted. Such CPM schedules allow for more reliable forecasting of work, resources and cashflow. It appears that the 2006 CPB Schedule does includes a significant amount number of constraints and unconventional logic ties (Start-to-Start or Finish-to-Start with excessive lags) which therefore may taint the true critical path. Our detailed comments relative to other K-H Standard 10 – Scheduling guidelines and the 2006 CPB Schedule development issues may be found in Sections 4.4.2 through 4.4.7 of this report.

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#### 4.4.2 Critical Differences Between 2006 Plan and 2010 Plan

In an effort to understand the major changes between the 2006 and 2010 CPB Schedules we developed a summary comparison of the two electronic files for only the areas we have reviewed. It appears that K-H has used a combination of the following actions to achieve the reported 2006 CPB Schedule acceleration:

- Sequencing deactivation, decommissioning and remediation activities more concurrently
- Starting earlier for B371/374 and B707 deactivation and decommissioning work
- Redefining MAA and Legacy Waste Removal Milestones relative to the amount of waste remaining at the time of the Milestone forecast (this was done without changing the MAA definition or MAA criteria).
- Replacing 2010 driving predecessor logic with new logic to predecessors that complete earlier
- Replacing 2010 constrained start dates with new logic ties
- Replacing 2010 LOE activities with new detailed work activities

Conversely there have been a few reported slips to the 2006 CPB Schedule SNM Operations activities.

The 2006 CPB vs 2010 CPB Schedule on the following pages provides a graphic summary of the major elements reviewed. A written overview of the changes to these elements is contained below.







**PBD 002 Waste Management Project**

The summary of the changes for the WBS reviewed is shown in the chart below. Further details are contained in Section 4.4.5.

<b>WBS</b>	<b>Description</b>	<b>Milestone Activity Effected</b>	<b>Reported Change from 2010 CPB Schedule</b>	<b>Cause for Change</b>
1.1.04.03.01.02	B664 TRU/TRM Storage/Staging Operations	A4EMILE481 Complete B644 Waste Operations	4 year acceleration	change in scope and approach
1.1.04.03.01.03	B776 TRU/TRM Storage/Staging Operations	A4EC131002 Complete B776 Evacuation	1 year acceleration	deletion of B776 Storage Operations for FY00
1.1.04.03.01.06	B991 TRU/TRM Storage Operations	A4EMILE496 Complete B991 Storage of TRU Waste	1 year delay	extended use of B991 through FY03
1.1.04.03.02.02	Dev and Impl New TRM Waste Storage/Staging Facilities	A5EC432160, Achieve Beneficial Occupancy for B440 Staging Module	17 month acceleration	removal of the B440 Shipping Module Construction scope as the predecessor effort for this Milestone

**PBD 006 SNM Consolidation Project****WAD 10 Pu Storage Project**

*Variance from 2010 CPB Completion Forecast = 26 to 27 month Acceleration*

1. The Milestone B0SMILE393, B707 Consolidation of Packaged Residues Complete reflects approximately a 26-month acceleration in the 2006 CPB Schedule attributable to a change the driving logic. The 2010 CPB Schedule reflected that Transfer of packaged SNM to Building 371 drove the Milestone; the 2006 CPB Schedule now reflects that the Removal of eU Hemishells drive the Milestone (forecast to complete March 31, 2000).

**PBD 008 Pu Metal Oxides Stabilization Project****WAD 13 Pu Processing & Packaging**

*Variance from 2010 CPB Completion Forecast = 10 to 11 month Delay*

1. PuSPS Construction/Operation/D&D reflects a delay to deactivation and decommissioning due to the 11-month extension to SNM Holdup B776/771/707/371 processing.

**PBD 009 Pu Solid Residue Stabilization Project****WAD 88 Ash Stabilization*****Variance from 2010 CPB Completion Forecast = 1 month Delay***

1. The complete Repacking Ash Milestone has been delayed by approximately one month due to the addition of a constraint date of December 28, 2000 on the DFSNB Milestone.

**WAD 89 Building 371 Residues Elimination Project*****Variance from 2010 CPB Completion Forecast = 4 to 6 month Delay***

1. The Wet Combustibles Closure Project reflects approximately four months of delay due to addition of Activity J9W3206103, FY02 WET Combustibles Closure Project Management (84 work days) into the closure sequence. This activity is a direct predecessor to the Milestone for completing all Wet Combustible shipments to WIPP.
2. The Milestone for IDC 393 Ready to Ship to WIPP reflects approximately a six-month delay due to added Activity J9K200HGS, FY01 SS&C Head Space Gas Sampling (one-month original duration). The new activity is tied to an operations activity (Activity J9K1507611, FY00 IDC 393 Operations) with a five-month lag from its start. The operation activity is forecast to complete September 14, 2000 in the 2006 CPB Schedule. However, the lag relationship causes a five-month unidentifiable period of time.

**PBD 012 SNM Shipping Project****WAD 22 SNM Shipping Project*****Variance from 2010 CPB Completion Forecast = 8 to 9 month Acceleration***

1. Transfer of packaged SNM to Building 371 has been accelerated by approximately 8 months due to the deletion of the driving predecessor B0SMILE252, B707 Consolidation of Pkg SNM to B371 Complete. The 2006 CPB Schedule forecast completion for new driving predecessor Activity C2UMILE293, Compl Offsite Shipment of Composites remains as it was in the 2010 CPB Schedule, September 27, 2001.

**PBD 013 Closure Caps Project****WAD 23 Closure Caps Project*****Variance from 2010 CPB Completion Forecast = 47 to 48 month Acceleration***

1. The project acceleration of the 700 Area cap can be attributed to the change in driving predecessor logic due to the deletion of the 300 Area cap and the resultant resequencing of work. In the 2010 CPB Schedule the driving predecessors were the 300 Area cap and Building 707 closure. In the 2006 CPB Schedule the driving predecessor is currently reported as Building 776/777 closure. Due to the acceleration of both Building 707 and 776/777 and the deletion of the 300 Area cap, the 700 Area cap is anticipated to complete approximately 47 months ahead of the 2010 forecast.

**PBD 016 Building 371 Cluster Closure Project*****Variance from 2010 CPB Completion Forecast = 13 to 14 month Acceleration***

1. The 13-month delay to the completion of SNM hold-up removal requiring stabilization and 12-month delay to cluster deactivation is primarily due to the addition of the detailed decommissioning activities between September 2004 and September 2005 which potentially could contain SNM hold-up. The 2006 CPB Schedule Milestone driving activity is the plenum dismantlement (D1QEDIS245).
2. The Milestone B371/374 Complete Legacy Waste Removal has reported an acceleration of over 33 months in the 2006 CPB Schedule by changing the driving logic. The 2010 CPB Schedule reflected that the Building 371 decommissioning drove the Milestone; the 2006 CPB Schedule now reflects that the TRU/TRM Legacy Waste Pre-Certification drives the Milestone.
3. The anticipated MAA 12-month acceleration is driven by the change in the 2006 CPB Schedule predecessor logic. The activity Comp CAT I/II Holdup Removal/Close B371/374 MAA was driven by two LOE activities in 2010 CPB Schedule for SNM Cat I & II removal forecast to complete September 30, 2003. In the 2006 CPB Schedule the MAA closure is driven by the deactivation and decommissioning of the PuSPS Packaging system forecast to complete September 30, 2002.
4. The apparent 13-month acceleration to IHSS/IBC Remediation completion can be attributable to the concurrent sequencing of the cluster deactivation, decommissioning and remediation activities in the 2006 CPB Schedule. The 2010 CPB Schedule reflected these activities as sequential work.

**PBD 017 Building 707/750 Cluster Closure Project*****Variance from 2010 CPB Completion Forecast = 26 to 27 month Acceleration***

1. The 24 month reported acceleration for SNM removal and deactivation may be attributed to the early start (SNM removal - 16 months ahead and deactivation 28 months ahead of the 2010 CPB Schedule forecasts) of the activities and the concurrent sequencing of SNM removal and deactivation. The 2010 also showed SNM removal and deactivation concurrent; however the 2006 CPB Schedule appears to be more aggressive.
2. The remaining few months of acceleration to achieve Building 707 IHSS/UBC Remediation completion 26 months earlier can be attributed to the slight overlap of the decommission activities with deactivation and remediation work as well. The 2010 CPB Schedule showed only decommissioning planning during FY06 and the actually Building 707 demolition was not forecast to begin until December 2005. The 2010 CPB Schedule showed deactivation, decommissioning and remediation work sequential.

3. We note that the 2006 CPB Schedule forecast for Building SNM Holdup Removal (March 28, 2002) has slipped by approximately 18 months from the 2010 CPB Schedule forecast of September 28, 2000. We also note however, that the 2010 forecast was based on a constrained start date.

### **PBD 018 Building 771/774 Cluster Closure Project**

***Variance from 2010 CPB Completion Forecast = 28 to 29 month Acceleration***

1. The two-month reported acceleration of SNM Holdup Removal was achieved by placing an early start constraint on Activity D4KSNM1430, Revise Procedure/Plans/Documentation - FY00 to begin on October 4, 1999. Previously, the activity was forecast to begin November 29, 1999.
2. Although the Building 771 Liquid Complete Milestone is still forecast for December 31, 2001 as in 2010, the following added Sludge Tank Deactivation Activities impact the completion of sludge and liquid deactivation.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
D4ASR100	Removal of Sludge Tanks 201,202,203, & 204	261	11-Apr-01*	3-Jun-02	15
D4ASR120	Start Operations --Milestone for TSIS (WAD 07)	0	1-Oct-01*		28
D4ASR110	Removal of Sludge Tanks T-40 (old) & T-40 (new)	93	11-Mar-02*	5-Aug-02	26
D4ATD400	Preps to Drain & remove - TRU Organics	86	2-Oct-00*	15-Feb-01	168
D4ATD610	Preps to Drain & remove - Reagent System	49	1-Feb-01	18-Apr-01	127
D4ATD410	Drain - TRU Organics	34	19-Feb-01	10-Apr-01	188
D4ATD510	Preps to Drain & remove - LL TSCA Organics	87	19-Feb-01	3-Jul-01	168
D4ATD420	Remove - TRU Organics	9	11-Apr-01	24-Apr-01	188
D4ATD620	Drain - Reagent System	18	19-Apr-01	16-May-01	127
D4ATD430	Closure Documents - TRU Organics	13	25-Apr-01	15-May-01	188
D4ATD630	Remove - Reagent System	5	17-May-01	23-May-01	127
D4ATD640	Closure Documents - Reagent System	9	24-May-01	7-Jun-01	182
D4ATD520	Drain - LL TSCA Organics	33	5-Jul-01	24-Aug-01	168
D4ATD530	Remove - LL TSCA Organics	9	27-Aug-01	10-Sep-01	168
D4ATD540	Closure Documents - LL TSCA Organics	13	11-Sep-01	1-Oct-01	168
D4ATD310	Preps to Drain & remove - 1st Stage Upstairs	48	4-Jun-02	19-Aug-02	15
D4ATD110	Preps to Drain & remove - 1st Stage Downstairs	49	9-Jul-02*	23-Sep-02	15
D4ATD210	Preps to Drain & remove - 2nd Stage Downstairs	49	6-Aug-02*	21-Oct-02	15
D4ATD320	Drain - 1st Stage Upstairs	18	20-Aug-02	17-Sep-02	121
D4ATD330	Remove - 1st Stage Upstairs	5	18-Sep-02	24-Sep-02	121
D4ATD130	Drain - 1st Stage Downstairs	18	24-Sep-02	21-Oct-02	15
D4ATD340	Closure Documents - 1st Stage Upstairs	9	25-Sep-02	8-Oct-02	268
D4ATD140	Remove - 1st Stage Downstairs	4	22-Oct-02	28-Oct-02	59
D4ATD220	Drain - 2nd Stage Downstairs	18	22-Oct-02	18-Nov-02	15
D4ATD120	Closure Documents - 1st Stage Downstairs	9	29-Oct-02	11-Nov-02	59
D4ATD230	Remove - 2nd Stage Downstairs	4	19-Nov-02	25-Nov-02	15
D4ATD240	Closure Documents - 2nd Stage Downstairs	9	26-Nov-02	11-Dec-02	41

\* asterisk indicates constrained date

3. The Building 771 decommissioning and remediation activities reflect an acceleration of over 28 months in the 2006 CPB Schedule due to the shortened duration of the decommission work by nearly the same duration. We note that the duration of the remediation work has been extended but is also started over three years earlier. The original remediation duration of 12 months still is sequenced after the completion of the decommissioning activities.
4. The Milestone B771/374 Complete Legacy Waste Removal reflects an acceleration of approximately 16 months in the 2006 CPB Schedule due to a change in the driving logic. The 2010 CPB Schedule reflected that the Set 75 decommissioning would drive the Milestone; the 2006 CPB Schedule now reflects that the Set 53 decommission will drive the Milestone.

**PBD 019 Building 776/777 Cluster Closure Project**

***Variance from 2010 CPB Completion Forecast = 24 to 25 month Acceleration***

1. In the 2010 CPB Schedule, 776/777 MAA closure was tied to a SNM Verification Activity (D5P0002010) showing a forecast completion of September 29, 2000. The driving relationship to the 776/777 MAA closure was a Finish to Start with +9-month lag therefore forecasting the MAA closure date of June 29, 2001. The basis for the 9-month lag is not known. In the 2006 CPB Schedule, the logic has been revised to tie into a physical deactivation activity (DHD500MS8) forecast to complete June 30, 2000, approximately three years prior to completion of all SNM removal and 15 months prior to deactivation completion.
2. The near 29-month reported acceleration of completing all Building 776/777 SNM holdup requiring stabilization may be attributed to the added level of detail within this WAD. The 2010 forecast of September 30, 2005 was driven by several LOE activities where as the 2006 CPB Schedule forecast is driven by the completion of Set 80 ventilation shutdown where there may be SNM holdup.
3. The approximate 28-month reported acceleration of completion of Building 776/777 decommissioning can be attributed primarily to the 2006 CPB Schedule early start (24 months) of the work and the decreased duration of the decommissioning.
4. The reported acceleration for deactivation and decommissioning as explained translates through to the reflected acceleration of Building 776 IHSS/UBC Remediation. We note the concurrent scheduling of the remediation and decommissioning work since the 2010 CPB Schedule showed this work sequential.

**PBD 024 - Safeguards & Security Project****PA Closure**

*Variance from 2010 CPB Completion Forecast = 23 to 24 month Acceleration*

1. The 2010 CPB Schedule forecast of September 30, 2004 for PA Closure was primarily driven by several LOE Site Operations Support activities. The 2010 CPB Schedule non-driving predecessor was Completion of Metal, Oxide and Remaining Shipments forecast to complete September 2, 2002. The 23- to 24-month reported acceleration can be attributed to the detailed planning that has been incorporated into the 2006 CPB Schedule. Several issues relative to the 2006 CPB Schedule sequence leading to the PA Closure are discussed below.
2. The 2006 CPB Schedule reflects the following activities as predecessors to G021102H15, Preparation for PA Closure, which is forecast to begin October 1, 2002:

Activity ID	Activity Description	Early Start	Early Finish	Total Float
D1QMILE303	Comp CAT I/II Holdup Removal/Close B371/374 MAA	30-Sep-02	30-Sep-02*	0
D2RMILE305	B707- Close MAA	28-Mar-02	30-Sep-02	115
D4KMILE307	FY00-T3 Cmpl SNM Holdup Removal in B771	23-Aug-99	30-Sep-99	25
D4KMILE309	FY00-T4 Close MAA in B771	21-Sep-99	30-Sep-99*	7
D5HMLE311	FY01-T2 Close MAA in B776/777 by 9/30/01	30-Jun-00	30-Jun-00*	0
E5MMILE020	DOE Appr Phy Security Dev for PA Closure	15-Jul-02*	15-Jul-02*	0

\*asterisk indicates constrained date

We note that four out of the six activities have been manually constrained and that the PA Closure appears to be only logically tied in the 2006 CPB Schedule to Buildings 371/374, 771/774, and 776/777. The manual constraint will not allow the PA Closure preparation activity to slip with the predecessor slip but will only reflect negative float. It is also unclear why other logic relationships to potential critical activities (i.e., 707) are not reflected in the 2006 CPB Schedule.

3. The PA Closure has two primary driving paths based on the 2006 CPB Schedule. The paths are shown in the figures below:

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Total Float	FY99	FY00	FY01	FY02	FY03
<b>PA Closure</b>										
D1QMILE303	Comp CAT I/II Holdup Removal/Close B371/374 MAA	0		30SEP02	0					
G021102H15	Preparation for PA Closure	15	01OCT02	21OCT02	0					
G02MILE301	PA Closure	0		31OCT02	0					
<b>PA Path 1 - PuSPS</b>										
B3HDK11700	DOE Approval to Commence Operations	2	29NOV99	30NOV99	0					
B3HMLE264	FY00-T7 Install & Operate B371 Pu Packaging Sys	0	01DEC99		0					
B3HXL12200	Operate PuSPS - (00)	191	01DEC99	28SEP00	0					
B3HMLE274	IP306 Start Pkg Metal or Oxides in 3013 Cans	0	31JAN00		0					
B3HXL12201	Operate PuSPS (01)	190	02OCT00	31JUL01	0					
B3HXL15000	Process SNM Holdup Rem - B776/771/707/371 (01)	37	01AUG01	27SEP01	0					
B3HXL16000	Process SNM Holdup Remov - B776/771/707/371 (02)	171	01OCT01	28JUN02	0					
B3HPUSPSD2	PuSPS - Packaging -Deactivate/Decontaminate (02)	57	01JUL02	30SEP02	0					

The first primary driving path to PA Closure is the installation and operation of the PuSPS, processing of SNM Holdup and the deactivation of the PuSPS. The driving activities appear to be LOE – type and not directly tied to the related decommissioning/generation activities. K-H has stated that the activity durations for Operate PuSPS and Process SNM Holdup activities are substantiated by a detailed material management campaign and are appropriately tied. For FY99 and FY00 there appears to be sufficient information available to show the appropriate interdependency relationship between the Operate PuSPS activities and the appropriate decommissioning activities. We recommend that K-H review the scope and interfaces of this scope and make the necessary schedule revisions to show the activity interdependencies

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Total Float	FY99	FY00	FY01	FY02	FY03
<b>PA Path 2 - Offsite Shipping SNM &amp; MO</b>										
A0FY199900	MILESTONE - START FY99	0	01OCT98*		0					
C2START999	MAD 22 FY99 Start Milestone	0	01OCT98		0					
C2SMISC042	DETERMINE CONTAINMENT VESSELS - M & O	228	01OCT98	30SEP99	0					
C2SMISC062	PROJECT PLANNING - METALS & OXIDES FY99	228	01OCT98	30SEP99	1					
C2SMISC060	Certify Shipping Containers - FY00	227	04OCT99	28SEP00	0					
C2SMISC070	Certify Shipping Containers - FY01	227	02OCT00	27SEP01	0					
C2S0040100	Composites Shipment #1 - Make Ready	23	23FEB01*	29MAR01	0					
C2S0040200	Composites Shipment #2 - Make Ready	23	23FEB01	29MAR01	0					
C2S0040300	Composites Shipment #3 - Make Ready	23	25APR01	31MAY01	0					
C2S0040400	Composites Shipment #4 - Make Ready	23	25APR01	31MAY01	0					
C2S0040500	Composites Shipment #5 - Make Ready	23	26JUN01	31JUL01	0					
C2S0040600	Composites Shipment #6 - Make Ready	23	26JUN01	31JUL01	0					
C2S0040700	Composites Shipment #7 - Make Ready	23	23AUG01	27SEP01	0					
C2S0040800	Composites Shipment #8 - Make Ready	23	23AUG01	27SEP01	0					
C2SMISC080	Certify Shipping Containers - FY02	214	01OCT01	06SEP02	0					
C2S0050100	eU Parts Shipment #1 - Make Ready	23	24OCT01	30NOV01	0					
C2S0050200	eU Parts Shipment #2 - Make Ready	23	24OCT01	30NOV01	0					
C2S0050300	eU Parts Shipment #3 - Make Ready	23	27DEC01	31JAN02	0					
C2S0050400	eU Parts Shipment #4 - Make Ready	23	27DEC01	31JAN02	0					
C2S0050500	eU Parts Shipment #5 - Make Ready	23	22FEB02	28MAR02	0					
C2S0050600	eU Parts Shipment #6 - Make Ready	23	22FEB02	28MAR02	0					
C2S0050700	eU Parts Shipment #7 Placeholder - Make Ready	23	25APR02	31MAY02	0					
C2S0050800	eU Parts Shipment #8 Placeholder - Make Ready	23	25APR02	31MAY02	0					
C2S0050900	eU Parts Shipment #9 Placeholder - Make Ready	23	26JUN02	31JUL02	0					
C2S0051000	eU Parts Shipment #10 Placeholder - Make Ready	23	26JUN02	31JUL02	0					
C2S0051100	eU Parts Shipment #11 Placeholder - Make Ready	23	26JUN02	31JUL02	0					
D1002100100	Final Facility Scan/M&O Closure Activities	64	01JUL02	30SEP02	0					
C2S0051200	eU Parts Shipment #12 Placeholder - Make Ready	23	01AUG02	06SEP02	0					
C2S0051300	eU Parts Shipment #13 Placeholder - Make Ready	23	01AUG02	06SEP02	0					
C2S0051400	eU Parts Shipment #14 Placeholder - Make Ready	23	01AUG02	06SEP02	0					
D10315T041	Set 11 B371 Vaults Drum Storage Dept/SNM Rem	15	16AUG02	06SEP02	0					
C2SMILE295	Complete Offsite Shipping of SNM M&O (9/30/02)	0		06SEP02	0					

- Similar to the PuSPS driving path to PA Closure, the Shipment path also appears to be mostly comprised of LOE activities. K-H has stated that the shipment activities are unit costed and individually scheduled; they have also stated that additional breakdown of the shipment activities would require access to classified information.
- Additionally, many of the driving relationships are Finish-to-Start with a positive lag of 10-to-15 work days. This creates an unidentifiable period of time which K-H has stated the lags represent transportation and receiver site schedules. Should the lags be removed, transportation and receiver site activities added, and the schedule recalculated, the critical path may change. For FY99 and FY00 there appears to be sufficient information available to show the appropriate interdependency relationship between the support LOE activities and



the appropriate decommissioning activities. Appropriate interdependency relationships are needed in order to accurately determine the impact of decommissioning changes on the LOE activities, (i.e., if decommissioning gets delayed there could be a potential impact to the LOE durations and cost). We recommend that K-H review the scope and interfaces of this scope and make the necessary 2006 CPB Schedule revisions to show the activity interdependencies. Additionally, we recommend that K-H review the Finish-to-Start relationships with positive lags and identify the lag periods with activities.

6. In reviewing the zero total float path as reflected by the electronic copy of the 2006 CPB Schedule, we note that approximately 500 activities (4%) have a zero total float value. These activities are spread across many of the PBDs. However, in reviewing the 2006 Critical Path Exhibit in the 2006 PMP, it is unclear whether all activities shown in the Exhibit are critical or if only those activities highlighted in red are critical. In either case, the 2006 Critical Path Exhibit does not accurately reflect all the zero total float activities which comprise the multiple concurrent critical paths as shown in the electronic copy of the 2006 CPB Schedule. This may provide a limited view of the true critical activities to those who only review the PMP Exhibits. We also note that the number of zero float activities in the 2010 CPB Schedule was approximately 36% of the total activities.

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### 4.4.3 Special Nuclear Materials

#### *Approach*

The following comments, concerns and recommendations are the result of the team's review of those portions of the 2006 Closure Project Baseline (CPB) Schedule we felt were critical to site closure as scheduled in 2006. We did not review all of the 2006 CPB Schedule assumptions, scope and sequence; we reviewed a representative set of the Work Authorization Documents (WADs) within several critical Project Baseline Descriptions (PBDs). The comments below are organized by Work Authorization Documents (WADs) and Work Breakdown Structures (WBSs) reviewed in conjunction with the SNM. The PBDs reviewed in connection with the SNM are:

- PBD 006 SNM Consolidation Project
- PBD 008 Pu Metals and Oxides Stab Proj
- PBD 009 Pu Solid Residue Stab Project
- PBD 012 SNM Shipping Project

The WADs reviewed in connection with the SNM are:

- WAD 010 Pu Storage Project
- WAD 013 Pu Processing & Packaging Project
- WAD 014 NDA Program
- WAD 015 Salt Stabilization Project
- WAD 020 Dry Residue Elimination Project
- WAD 022 SNM Shipping Project
- WAD 089 B371 Residues Elimination Project
- WAD 090 Residue Program Support Project

#### *Basis & Assumption Issues*

#### **WAD 010 – Pu Storage Project**

<b>K-H Project Management Plan Assumption</b>	<b>Comment</b>
1. Savannah River, Oak Ridge Y-12, WIPP and NTS will receive material according to the Closure Project Baseline Schedule.	The capacity of these sites to handle the 2006 CPB quantities has not been confirmed. It is also not known if the receiver sites have accepted the 2006 CPB Schedule anticipated delivery schedule.
2. New requirements or implementation interpretations of existing requirements will not significantly affect resources, schedules or cost.	K-H project integration staff has stated that the 2006 CPB Schedule contains no contingency. We recommend that K-H ensure that the SNM Operation activities reflect the Schedule Confidence Interval Delta Contingency as stated in the K-H Standard 10 – Scheduling.

**WAD 013 – Pu Processing & Packaging Project**

<b>K-H Project Management Plan Assumption</b>	<b>Comment</b>
1. The DOE supplied Government Furnished Equipment (GFE), BNFL Packaging System will perform as designed without significant modifications.	It appears unreasonable that the 2006 CPB Schedule does not allow for modifications.
2. The Packaging System will be capable of continuous operations, without excessive maintenance, such that its availability will be not less than 72%.	The basis for the 72% availability can not be determined from the documentation available. It is also unclear how the 72% is reflected in the 2006 CPB Schedule.
3. The Packaging System will be capable of functioning at a minimum rate of not less than one container every two hours, either metal or oxide.	The basis for the productivity rate can not be determined from the documentation available nor is it obvious that this production rate was applied when calculating activity durations in the 2006 CPB Schedule.
4. Per DOE-STD-3013, Loss-On-Ignition testing, Supercritical Fluid Extraction and/or other approved methods for testing the moisture content of plutonium oxide will be available in time to support the schedule and be successful for all subject oxides.	The statement "available in time" is vague and the approval can not be directly tied to the 2006 CPB Schedule with the information supplied.
5. A DOE approved deviation path will be available for packaging and shipping materials in 3013s which cannot meet the 3013 standard (low Pu content, moisture cannot be measured accurately, etc.)	It is not clear when or if this "approved deviation path" is required based on the information available.
6. Repackaging of materials which cannot meet the 3013 standard will be minimal (0% for metals, less than 5% for oxides).	It is not clear from the information what the impact would be if the repackaging was minimal, however, schedule delay is possible.
7. Data obtained from the HSP 31.11 surveillance program will not result in a change to the surveillance requirements for plutonium metal.	It is not clear from the information what the impact would be if the surveillance requirements were changed, however, schedule delay is possible.
8. Data and a technical basis will support the elimination of surveillance requirements per HSP 31.11 for material that is packaged in DOE-STD-3013 containers.	See comment for #7 above.

**WAD 014 – NDA Program**

<b>K-H Project Management Plan Assumption</b>	<b>Comment</b>
1. Assumed that DOE Orders and other requirements for protection and accountability of nuclear materials; handling and management of materials; operation of facilities; waste management; environment, safety, and health; administration of capital projects; and contractual obligations will not significantly change during the life of these projects.	The statement "significantly" is undefined and the 2006 CPB Schedule should reflect the Schedule Confidence Interval Delta Contingency as stated in the K-H Standard 10 – Scheduling.

**WAD 015 – Salt Stabilization Project**

<b>K-H Project Management Plan Assumption</b>	<b>Comment</b>
1. There will be no change required in configuration, location, or operability requirements for treatment systems in operation due to DOE direction.	It appears unreasonable to exclude a contingency for no changes. We recommend that K-H ensure that the SNM Operation activities reflect the Schedule Confidence Interval Delta Contingency as stated in the K-H Standard 10 – Scheduling.

**WAD 020 – Dry Residue Elimination Project**

<b>K-H Project Management Plan Assumption</b>	<b>Comment</b>
1. There will be no change required in configuration, location, or operability requirements for treatment systems in operation due to DOE direction.	It appears unreasonable to exclude a contingency for no changes. We recommend that K-H ensure that the SNM Operation activities reflect the Schedule Confidence Interval Delta Contingency as stated in the K-H Standard 10 – Scheduling.
2. WIPP will accept proposed alternatives to Passive-Active Drum Counter: Segmented Gamma Scanner, Neutron Multiplicity Counter/Gamma Ray Isotopic, and for LECO crucibles, statistical verification of existing count sheets.	DOE advises that this assumption is reasonable, therefore no contingency plan is required.
3. WIPP will accept measured hydrogen generation rate data that is within limits for existing drums containing <200 Fissile Gram Equivalent (FGE), but exceeding wattage limits.	DOE advises that this assumption is reasonable, therefore no contingency plan is required.

**WAD 022 – SNM Shipping Project**

<b>K-H Project Management Plan Assumption</b>	<b>Comment</b>
1. DOE regulations will not require changes to existing Material At Risk (MAR) criteria in the Facilities.	It is not clear from the information what impact a change to the MAR criteria could have on the schedule.
2. Criticality Safety Operating Limits (CSOLs) evaluations will allow for full operation and material handling as planned.	Anything that impedes full operation and material handling could impact the schedule.
3. No SNM will be received from outside RFETS.	Schedule delay, contractor acceleration, increased costs may all result from receiving SNM from outside sites.
4. Safe Secure Transports (SSTs) will be made available by the Surety Transportation Division to support baseline SNM shipping schedule and the loading configurations do not change their capacity.	The quantity of SSTs required to support the 2006 CPB Schedule can not be accurately assessed based on the information available.
5. Operations throughput from the PuSPS will support the shipping schedules required. These throughputs are identified on the Rocky Flats Closure Project Completion Metrics Baseline.	The 2006 CPB Schedule applies a level of effort LOE activity for the operation of the PuSPS and the basis for the productivity rate can not be verified based on the information available.
6. Chalfant 9965, 9968 and 9975, DOT-6M, DT-22, FL, and UNC-2901 shipping containers will be certified for the intended use and available when needed.	The statement "available when needed" is vague and it is already known that the approval of containers for residues, Classified Pu Metals, Pu Metals and Oxides is impacting the current plan.
7. The respective SARP for the Chalfant 9965, 9968 and 9975, DOT-6M, DT-22, FL, and UNC-2901 shipping container will not be changed in a manner affecting use.	See comments in #6 above.
8. Receiver availability (including container turnaround/refurbishment) will not restrict shipment schedules. Receivers, LANL, LLNL, ORNL Y-12, Pantex, SRS, and TVA, will be ready and prepared to accept material based upon a mutually agreed upon schedule; receiver downtime will not prevent shipments.	The schedules of the receiver sites have not been verified and it is known at this time there are issues surrounding the shipments to LANL and SRS.

**WAD 089 – B371 Residues Elimination Project**

<b>K-H Project Management Plan Assumption</b>	<b>Comment</b>
1. All of the material to be processed is according to the Ulrich 4/95 database.	No comment.
2. Technical justifications for rebaselining the Wet Project will be approved. This includes the use of actual project feedback (a part of the ISMS process) to refine production assumptions.	No comment.
3. Wet Combustible production rates will be met on a weekly basis. If not, the use of the 5th day during a 5-day work week, AWS.	Production rates are critical to the completion of the removal of Wet Combustibles. Failure to meet rates could result in schedule delay.
4. Fridays and weekends will be used as necessary to maintain schedule.	No comment.
5. Savannah River will receive Plutonium Fluoride shipments in November 1999.	The 2006 CPB Schedule forecast the fluoride shipments to begin September 30, 2000 and complete September 30, 2001.
6. Materials that are greater than 10% plutonium by weight will be blended down to less than 10% plutonium by weight.	No comment.
7. Solid residues that are listed as hazardous waste may, after treatment, be stored without meeting Land Disposal Restrictions (LDR's) per Compliance Order on Consent No. 93-04-23-01.	No comment.
8. The treated residues will be TRU waste.	DOE advises that all treated residues are or will be TRU waste.
9. The Residue Environmental Impact Statement (EIS) will be approved in time to meet production and shipping metrics.	DOE advises that the ROD for the EIS has been issued.
10. Non-Destructive Assay (NDA) equipment installed for the baseline processes (SGS) will be sufficient to meet through-put as well as WIPP and safeguards requirements.	The basis for the productivity of the NDA equipment cannot be verified with the information provided.
11. Unexpected conditions such as contaminated drums, contents different than marked, damaged containers, etc, will not be encountered in more than 10% of the feed material for SS&C, 10% of the feed material for Wet Combustibles repack and 60% of the feed material for Wet Combustibles gas generation testing. Gas Generation Testing efficiency will be no less than 80%.	The basis for the feed material quantities cannot be verified with the information provided.
12. Overall process efficiency (which includes transportation, equipment reliability, operating personnel availability, building availability) will be no less than 75 percent.	The basis for the process efficiency can not be verified with the information provided.
13. On-site transportation and Waste Management capabilities will support residue processing requirements.	The documentation to support the onsite transportation is not integral with the 2006 CPB Schedule and was not verified at this time.

### Scope Issues

These issues are covered below in the Schedule Development Issues.

### Schedule Development Issues

1. It is noted that there are several activities within the above referenced PBDs that do not appear to meet K-H's Standard-10 Scheduling requirement:

*A. Activity Durations/Level of Detail. Current FY activities and FY+1 activities will generally be two working weeks to three months in duration, except for procurement, regulatory actions, or level-of-effort activities, which do not have intermediate points for performance measurement. Longer term durations for true level-of-effort activities are permissible. Activities scheduled from FY+2 through completion will have durations reflecting the level of scope development.*

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
B0B9902150	Deactivate Vault #442	64	1-Jul-99	30-Sep-99	0
B0B9902160	Deactivate Vault #448	64	1-Jul-99	30-Sep-99	0
B3HDK11200	Plan of Action - Pkg & Stab	70	26-Jan-99	12-May-99	7
B3HCF64100	CP3 - Perform Packaging Tie-Ins	98	11-Mar-99	12-Aug-99	16
B3HCF63150	CP2 - Stabilization Internal Procurement	104	16-Dec-98	2-Jun-99	0
J8AFY99012	FY99 - 707 Module E Construction	115	31-Mar-99	29-Sep-99	1
B3HCF62000	CP1 - Building Modifications	116	1-Oct-98	6-Apr-99	64
B5R3CN1200	Constr. for Cal/Gamma	129	1-Dec-98	2-Jun-99	0
B4E84AE100	Design Installation - Air Bath Calorimeter - 707	130	1-Oct-98	6-Apr-99	20
B3H3013V99	3013 Can Procurement - Vendor (99)	131	29-Mar-99	30-Sep-99	41
B4E92AE100	Design Installation - Air Bath Calorimeter B371	131	1-Oct-99	6-Apr-00	0
B3HCF64050	Post Acceptance Testing Modifications	132	26-Jan-99	30-Jul-99	27

We recommend that K-H review the Standard-10 requirement and the 2006 CPB Schedule exceptions and make the necessary modifications to the 2006 CPB Schedule.



**WAD 010 – Pu Storage Project****1.1.04.07.02.02 – SNM Consolidation Program Management**

1. Complete PBD 006 Milestone 2006 forecast has not changed significantly from the 2010 forecast (September 2005) since the driving activities (PU Vulnerabilities Closure Group 1) appear to be year-long Level of Effort (LOE) activities in both CPB Schedules. However, while the 2006 CPB Schedule forecast for consolidation of material in Building B766/777 has maintained the same 2010 forecast dates, B707 Consolidation Milestone appears to have been accelerated by over two years. We note that in the 2010 CPB Schedule Activity B0SMILE252, B707 Consolidation Of Packaged Residues Complete was manually constrained to finish May 30, 2002 and is now driven by schedule predecessor logic (to the Removal or eU Hemishells) in the 2006 CPB Schedule. The basis for the reported Milestone acceleration cannot be determined from the information available. We recommend that K-H explain the acceleration basis and confirm the plan to achieve the B707 Consolidation Milestone over two years earlier.
2. The forecast for completion of all -Pu Vulnerabilities has been accelerated by approximately two years due to the acceleration of the Production Zone Cluster Closure Project (3.5 years) which then forced the Building 371 Pu Vulnerabilities on to the driving path for completion of all Pu Vulnerabilities. Building 371 Pu Vulnerability acceleration (2 years) will be addressed in Section 4.4.4.1 of this report.

**WAD 013 – Pu Processing & Packaging Project****1.1.04.08.01.05 – PUSPS in Building 371**

1. We note that the Stabilization Design Notice to Proceed - Contract Award is forecast to complete prior to the Design Complete for Stabilization since the predecessor of Activity B3HMF63110 is B3HME53300 and not B3HME53020. We also note that the time for DOE's review and approval of the design and the Contract Award is not clearly identified.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
B3HEE53200	DP2 - Stabilization Design for Procurement	28	1-Oct-98	12-Nov-98	0
B3HME53300	DP2 - Stabilization Design 90% Complete	0		12-Nov-98	0
B3HMF63110	CP2 - Issue Notice to Proceed - Contract Award	0		10-Dec-98	1
B3HME53020	DP2 - Design Complete for Stabilization	0		15-Dec-98	0

K-H has stated in order to achieve the DNFSB requirements and the D&D milestone for Building 371, K-H had to award a portion of the contract work prior to design completion. K-H has stated that DOE's approval is not required to proceed with the stabilization design. Other than Activity B3HCF64200, CP3-Let RFP/Develop IWCPs, there appears to be no time identified for contract award and that K-H's intent was to award to the contractor already onsite.

2. We note that Activity B3HED42000, Perform D&D for Wet Combustibles, is driven by the Milestone for FY99 as opposed to other work activities. We recommend that K-H review the sequencing and integration of this demolition work with potential 2006 CPB Schedule activities predecessor and add the necessary interface logic relationships to better reflect the actual work sequence. (K-H has stated that there were no real predecessor activities for this work and that the successor activities are adequately tied.)
3. It appears that the PuSPS installation sequence does clearly show an activity for project closeout but only reflects the Milestone B3HMF65102, 008 PuSPS Construction Project Closeout which is driven by the LOE activity for construction management and not the installation activities. It appears that the punchlist/close-out activities may be integrated within those activities relative to the system readiness check. Additionally, it is not clear if the Standard-10 additional 30% confidence interval is included in this sequence. We recommend that K-H identify where time is allotted for punchlist/close-out activities and contingency.
4. It appears that Activity B3HDK11700, DOE Approval to Commence Operations has an aggressive Original Duration of two work days and is the only DOE interface within this WAD reflected in the 2006 CPB Schedule. We recommend that K-H review this activity's scope and Original Duration as shown in the 2006 CPB Schedule.

#### 1.1.04.09.05.01.01 – Surveillance B371

1. It would appear that failure activities below have no logic ties to Building 707 to identify the resolution of the failures and the routing of the SNM. We recommend that K-H review the sequencing and integration of this work with potential 2006 CPB Schedule predecessor activities and add the necessary logic relationships to better reflect the actual work sequence.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
B3HXXW21000	B371 - Ship Surveillance Failures to B707 (99)	203	22-Oct-98	13-Sep-99	2
B3HXX22000	B371 - Ship Surveillance Failures to B707 (00)	35	4-Oct-99	29-Nov-99	2

#### 1.1.04.09.06 – Operate New Pu Metal/Oxide Stabilization & Packaging Process

1. We note that Activity B3HMLE261, IP307 Repkg all Metals & Oxides in 3013 Cans (DNFSB requirement), is constrained to complete May 31, 2002, when all the Activity predecessors are forecast to complete 10 months early on July 31, 2001. Additionally, the following activities continue beyond the July 31, 2001 commitment. K-H has stated that the additional SNM holdup process has no other available processing area and the processing can continue through June 2002 and still achieve the Building 371 D&D plan. K-H stated that the SNM Holdup processing will be done by an alternate to the PuSPS which has not yet been designed and that the DNFSB Milestone is only dependent on Metal & Oxide processing and not these SNM Holdup activities subsequent to May 31, 2001. We recommend that K-H confirm that this statement is in accordance with DOE's expectations and that the appropriate logic relationships exist between the SNM operation and B371 demolition activities.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
B3HGC37000	Project Oversight/Risk Management (01)	227	2-Oct-00	27-Sep-01	1
B3HMX14201	Performance Measure: Cum 1900 Total Cans Pkgd	0		31-Jul-01	426
B3HXL15000	Process SNM Holdup Rem - B776/771/707/371 (01)	37	1-Aug-01	27-Sep-01	0
B3HXL15120	Material Campaign Mgmt - SNM Holdup Rem (01)	37	1-Aug-01	27-Sep-01	1
B3HXL15350	PuSPS Oper. Records - SNM Holdup Removal (01)	37	1-Aug-01	27-Sep-01	1
B3HXM15100	Maint of PuSPs Ops Bases - SNM Holdup Rem (01)	37	1-Aug-01	27-Sep-01	1
B3HXM15500	3013 Surveillances SNM Holdup Removal (01)	37	1-Aug-01	27-Sep-01	58
B3HXL16120	Material Campaign Mgmt - SNM Holdup Rem (02)	170	1-Oct-01	27-Jun-02	1
B3HXL16350	PuSPS Oper. Records - SNM Holdup Removal (02)	170	1-Oct-01	27-Jun-02	1
B3HXM16100	Maint of PuSPs Ops Bases - SNM Holdup Rem (02)	170	1-Oct-01	27-Jun-02	1
B3HXM16500	3013 Surveillances - SNM Holdup Removal (02)	170	1-Oct-01	27-Jun-02	58
B3HXL16000	Process SNM Holdup Remov - B776/771/707/371 (02)	171	1-Oct-01	28-Jun-02	0
B3HGC39000	Project Oversight/Risk Management (02)	227	1-Oct-01	26-Sep-02	1
B3HMLE261	IP307 Repkg all Metals & Oxides in 3013 Cans	0		31-May-02*	122
B3HMLE045	SNM Stabilization and Packaging Complete	0		28-Jun-02	64
B3HMLE284	Complete PuSPS Stabilization of Holdup	0		28-Jun-02	94

2. It appears that the Material Campaign Management LOE activities which drive the processing of SNM holdup do not have interface logic with the waste generation sources. Although, we note that Activity B3HXL16000 Process SNM Holdup Remov - B776/771/707/371 (02) does have interface logic to Building 371, 776 and 707. For FY99 and FY00 there appears to be sufficient information available to show the appropriate interdependency relationship between the waste generation activities and the appropriate waste process and management activities. Appropriate interdependency relationships are needed in order to accurately determine the impact of waste generation changes on the management activities, (i.e., if waste generation gets delayed there could be a potential impact to the management durations and cost). We recommend that K-H review the scope and interfaces of this work and make the necessary 2006 CPB Schedule revisions to show the activity interdependencies.

### 1.1.04.09.06.02 – PuSPS Decontamination & Decommissioning

The following 2006 Milestone forecasts have not changed from the 2010 forecasts as shown:

Activity ID	Activity Description	2006 & 2010 Early Finish
B3HMF65102	PuSPS Construction Project Closeout	31-Mar-00
B3HMLE261	IP307 Repkg all Metals & Oxides in 3013 Cans	31-May-02*

\* This milestone has been manually constrained and is not driven by the predecessor Activity which completes approximately eleven months earlier.

The completion of PBD 008 as represented by activity B3ENDPBD08, PBD 008, – Complete Pu Metals and Oxides Stab Proj, in the 2006 CPB Schedule is approximately 10 months later than the 2010 forecast due to the following added activities associated with the PuSPS Decontamination & Decommissioning.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
B3HPUSPSD3	PuSPS - Packaging - Disassembly (02)	57	1-Jul-02	30-Sep-02	185
B3HPUSPSD8	PuSPS - D&D Support (02)	57	1-Jul-02	30-Sep-02	426
B3HPUSPSE2	PuSPS - Packaging - Decontamination (03)	27	1-Oct-02	11-Nov-02	203
B3HPUSPSE3	PuSPS - Packaging - Disassembly (03)	38	1-Oct-02	27-Nov-02	203
B3HPUSPSD6	PuSPS - Stabilization - Disassembly (03)	99	1-Oct-02	7-Mar-03	185
B3HPUSPSE8	PuSPS - D&D Support (03)	135	1-Oct-02	2-May-03	426
B3HPUSPSD4	PuSPS - Packaging - Transport Out of B371 (03)	55	2-Oct-02	30-Dec-02	451
B3HPUSPSD5	PuSPS - Stabilization - Decontamination (03)	81	29-Oct-02	7-Mar-03	185
B3HPUSPSD7	PuSPS - Stabilization - Transport Out of B371 (03)	36	10-Feb-03	4-Apr-03	426
B3HPUSPSD9	PuSPS - Building Repair & Cleanup (03)	36	10-Mar-03	2-May-03	426
B3ENDPBD08	Complete PBD 008 – Pu Metals and Oxides Stab Proj	0		2-May-03	928

### WAD 014 – Non Destructive Assay (NDA) Program

1. There have been no changes in the NDA Program implementation for the following elements:

- Combined Passive/Active Counters
- Air Bath Calorimeter B371
- Portable Holdup Gamma Detection
- Air Bath Calorimeter B707
- Procurement of Tomographic Scanners
- Segmented Gamma Scanners
- Upgrade Existing Calorimeter

However, operations and maintenance program LOE activity Original Durations have changed based on project life cycle changes.

2. It appears that Activity B4E84MN000, Calorimeter Maintenance FY99, is constrained to begin March 1, 1999 but the first Calorimeter installation (B4EMILE165 FY99 Equip Installation Complete-Air Bath-707) is not forecast to complete until September 2, 1999. This is an example of where LOE activities do not appear to have the appropriate interface logic to related detailed activities. We also note that this Maintenance Activity may also cover existing calorimeters. It also appears that other LOE activities within this WAD including but not limited to Holdup Measurement Program, Maintenance, Operation and Technical Support do not reflect the appropriate interface logic. For FY99 and FY00 there appears to be sufficient information available to show the appropriate interdependency relationship between LOE activities and the appropriate installation activities in this WAD. Appropriate interdependency relationships are needed in order to accurately determine the impact of installation changes on the LOE activities, (i.e., if installation gets delayed there could be a potential impact to the LOE durations and cost). We recommend that K-H review the scope and interfaces and make the necessary revisions to show the activity interdependencies in the 2006 CPB Schedule.

#### **WAD 015 – Salt Stabilization Project**

##### **1.1.04.09.04.01 – Operate Salt Stabilization**

1. We note that the IP - 312 Complete Repackaging of All Salts is forecast to complete (July 31, 2000) approximately two months prior to the completion of project support, management & closeout and material movement activities (September 28, 2000). The completion appears to be based on the completion of Activity B5S9009710, 00/4 PIPE PACKING (250 kg)s. It is unclear why the support activities continue beyond the actual work by 2 months. Additionally, Activity B5SMILE203, FY02-T2 - Complete Salt Stabilization is manually constrained to a date over two years after its predecessor (B5SMILE193 IP – 312 Complete Repackaging of All Salts) completes. Activity B5SMILE193 appears to be a DNFSB Milestone and K-H work associated with this Milestone appears to complete 2 years later. We recognize that the lag may be in accordance with Standard 10 - Scheduling to allow completion of milestones with a decreased level of risk. However, the two years appears excessive relative to the 30% confidence level or 10% of the project's duration guidelines for contingency in the Standard. We recommend that K-H review the date constraint on Activity B5SMILE203 FY02-T2-Complete Salt Stabilization and revise the 2006 CPB Schedule as necessary to achieve the DNFSB requirement.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
B5S9009710	00/4 Pipe Packaging (250 kg)	27	19-Jun-00	31-Jul-00	0
B5S9009711	00/4 Operations; MOD A (250 kg)	27	19-Jun-00	31-Jul-00	0
B5S9009714	00/4 Maintenance	27	19-Jun-00	31-Jul-00	39
B5S9009712	00/4 Project Support	65	19-Jun-00	28-Sep-00	1
B5S9009713	00/4 Project Mgmt & Closeout	65	19-Jun-00	28-Sep-00	1
B5S9009715	00/4 Material Movement	65	19-Jun-00	28-Sep-00	1
B5SMILE193	IP - 312 Complete Repackaging of All Salts	0		31-Jul-00	0
B5S9009820	Remaining FY00 WIPP CERT for B707 - 247 DRUMS	50	2-Oct-00	19-Dec-00	178

2. It appears that the operation of the Salt Stabilization Project is comprised mostly of the following LOE activities:

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
B5S3003010	99/1 Pipe Packaging (700 kg)	49	1-Oct-98	18-Dec-98	0
B5S3003011	99/1 Operations; MOD A (700 kg)	49	1-Oct-98	18-Dec-98	0
B5S3003012	99/1 Project Support	49	1-Oct-98	18-Dec-98	1
B5S3003013	99/1 Project Management	49	1-Oct-98	18-Dec-98	1
B5S3003015	99/1 Material Movement	49	1-Oct-98	18-Dec-98	1
B5S3003014	99/1 Maintenance	49	1-Oct-98	18-Dec-98	39

The FY99/1 activities appear to include all the appropriate interface logic but the activities for subsequent quarters through 2000 do not. For example, the Operations for FY99/2 is only preceded by FY99/1 Operations and succeeded by FY99/3 Operations. The FY99/1 Operations activity is preceded by Pipe Packaging and succeeded by project support, management and material movement. We recommend that K-H review the scope and interfaces of the referenced activities and make the necessary 2006 CPB Schedule revisions to show the activity interdependencies as shown in FY99/1.

#### 1.1.04.09.04.11 – Salt Operations Building 371

There appear to be no significant changes to the Activities within this WBS from the 2010 CPB Schedule.

1. The following LOE activities appear in this WBS:

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
B5R4CN3100	00/1 B371 POC Packing & Material Movement (1250kg)	48	4-Oct-99	17-Dec-99	0
B5R4CN9100	00/1 B371 Direct Repack Operation (1250kg)	48	4-Oct-99	17-Dec-99	0
B5R4CN9001	00/1 B371 Salt Project Management	48	4-Oct-99	17-Dec-99	1

For FY00/1, it appears that the Direct Repack Operation activity logic adequately reflects the interfaces with Project Management and no tie to POC Packing & Material Movement. The activities for subsequent quarters through 2000 do not even reflect the interface with Project Management. We anticipate that all three activities have some interface with each other. We recommend that K-H review the scope and interfaces of the referenced activities and make the necessary 2006 CPB Schedule revisions to show the activity interdependencies.

#### **WAD 020 – Dry Repack Residue Elimination Project**

##### **1.1.04.08.03.07.05 – B776 Dry Repack Preparations**

1. There appear to be no significant changes to the Activities within this WBS from the 2010 CPB Schedule. However, we note that Activity C0P7760P05B776, Dry Pre-Oper. IDC377 Coarse Firebrck, is forecast to start October 4, 1999 when its driving predecessor C0P7760P03 is forecast to complete one year earlier. (see below) The reason for the constraint can not be determined from the information available. We recommend that K-H explain the constraint and make the necessary modifications to the 2006 CPB Schedule.

Activity ID	Activity Description	WAD	Orig Dur	Early Start	Early Finish	Total Float	FY99	FY00
C0PSTRFY99	Begin FY99 Dry Repack Operations	020	0	01OCT98		1		
C0P7760P03	B776 Dry Pre-Oper. IDC312 Coarse Graphite	020	2	01OCT98	05OCT98	226		
C0P7760P05	B776 Dry Pre-Oper. IDC377 Coarse Firebrck	020	35	04OCT99*	29NOV99	0		
C0P7760P06	B776 Pre-Operations Dry Repack Complete	020	0		29NOV99	0		

2. The 2006 CPB Schedule for this WBS includes NDA Operations Activity for FY99 but not for FY00. We recommend that K-H review the WBS scope to ensure that NDA Operations are not required for FY00 or identify if the scope is included in another WBS.

#### **WAD 021 – B707 SNM Size Reduction & Stabilization**

##### **1.1.04.09.05.01 - Inspect/Brush/Repack**

The LOE activities for B707/777 HSP 31.11 Surveillance do not appear to reflect the interface logic with the appropriate B707/777 SNM Operation activities. For FY99 and FY00 there appears to be sufficient information available to show the appropriate interdependency relationship between LOE activities and the appropriate SNM Operation activities in this WAD. Appropriate interdependency relationships are needed in order to accurately determine the impact of SNM Operation changes on the LOE activities, (i.e., if SNM Operations get delayed there could be a potential impact to the LOE durations and cost). We recommend that K-H review the scope and interfaces and make the necessary 2006 CPB Schedule revisions to show the activity interdependencies.

#### 1.1.04.09.05.02 -- Thermally Stabilize and Repack

The LOE activities for Transfer Surveillances and Thermal Stabilization do not appear to reflect the interface logic with the appropriate SNM Operation and waste generation activities. For FY99 and FY00 there appears to be sufficient information available to show the appropriate interdependency relationship between LOE activities and the appropriate SNM Operation activities in this WAD. Appropriate interdependency relationships are needed in order to accurately determine the impact of SNM Operation changes on the LOE activities, (i.e., if SNM Operations get delayed there could be a potential impact to the LOE durations and cost). We recommend that K-H review the scope and interfaces and make the necessary 2006 CPB Schedule revisions to show the activity interdependencies.

#### 1.1.04.09.05.03 – Perform Size Reduction on Large Items

The following LOE material reduction processing activities do not appear to reflect the logic interfaces with the appropriate waste generation or SNM operation activities. For FY99 and FY00 there appears to be sufficient information available to show the appropriate interdependency relationship between LOE activities and the appropriate waste generation activities in this WAD. Appropriate interdependency relationships are needed in order to accurately determine the impact of waste generation changes on the LOE activities, (i.e., if waste generation gets delayed there could be a potential impact to the LOE durations and cost). We recommend that K-H review the scope and interfaces and make the necessary 2006 CPB Schedule revisions to show the activity interdependencies.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
C1M4000178	Stage Material for Processing FY99	78	1-Jun-99	30-Sep-99	36
C1M4000185	Stage Material for Processing FY00	122	4-Oct-99*	13-Apr-00	36
C1M4000211	Size Reduce Unclassified Material - FY00	122	4-Oct-99	13-Apr-00	36
C1M4000201	Size Reduce Classified Material FY00	122	4-Oct-99	13-Apr-00	57

#### WAD 022 - B707 SNM Shipping Project

The LOE shipment activities including the following WBS elements do not appear to reflect the logic interfaces with the appropriate waste generation or SNM operation activities:

- 1.1.04.10.04. – Non-WR Pits Shipments
- 1.1.04.10.06. – 4.5 % Uranium Shipments
- 1.1.04.10.07. – Enriched Uranium Shipments
- 1.1.04.10.11. – Scrub Alloy Shipments
- 1.1.04.10.12. – SNM Shipping Packaging & Support
- 1.1.04.10.20 – Shipment of SNM Metal & Oxides
- 1.1.04.10.16.2 – Pit Shipments funded by EW05



Additionally, the Integrated Transportation Plan does not appear to be tied to the shipment activities. For FY99 and FY00 there appears to be sufficient information available to show the appropriate interdependency relationship between LOE activities and the appropriate SNM Operation activities in this WAD. Appropriate interdependency relationships are needed in order to accurately determine the impact of SNM Operation changes on the LOE activities, (i.e., if SNM Operations get delayed there could be a potential impact to the LOE durations and cost). We recommend that K-H review the scope and interfaces and make the necessary 2006 CPB Schedule revisions to show the activity interdependencies.

#### **1.1.04.10.20 – Shipment of SNM Metal & Oxides**

1. It appears that the Unclassified Metal Shipments #1 & #2 - Make Ready complete January 28, 2000, just prior to SRS K Area Available for Unclassified on January 29, 2000 and is driven by logic tied to these two shipments. It appears to be more accurate that the SRS K Area availability be driven by SRS not RFETS activities. Additionally, the delivery of 9975 containers is not complete until eight months later (September 29, 2000). It is not clear whether any containers will be available in January. We recommend that K-H review this logic sequence and make the necessary 2006 CPB Schedule revisions.
2. It appears that there are no predecessors to the Pu Parts Shipments to LANL - Make Ready relative to the approval or procurement of containers. It is not clear whether all the containers are currently available. We recommend that K-H clarify this issue and make the necessary 2006 CPB Schedule revisions.
3. The only significant variance within WAD 1.1.04.10.20 Shipment of SNM Metal and Oxides is the eight-month acceleration of Activity C2SMILE043, Transfer of Packaged SNM To B371 Cmpl, from May 30, 2002 back to September 27, 2001. In the 2010 CPB Schedule, Activity B0SMILE252, B707 Consolidation of Pkg SNM to B371 Complete was the driving predecessor. Due to the logic revisions described above in WAD 010 – Pu Storage Project, 1.1.04.07.02.02 – SNM Consolidation Program Management, B707 Consolidation Milestone appears to have been accelerated by over two years. (We note that in the 2010 CPB Schedule Activity B0SMILE252, B707 Consolidation Of Packaged Residues Complete was manually constrained to finish May 30, 2002 and is now driven by schedule predecessor logic in the 2006 CPB Schedule and forecast to complete March 31, 2000). The basis for the acceleration is unknown.

#### **WAD 088 – Ash Stabilization Project**

1. Although the 2006 forecast dates for the Building 707 ash processing and other associated work remain the same as the 2010 forecasts, the Milestone for IP 315 Complete Repackaging Ash has been delayed approximately one-month due to the added activity constraint of December 28, 2000. The basis for the constraint can not be determined with the available information. We recommend that K-H confirm the constraint is in accordance with the DNFSB requirement.

- The LOE Process Ash Residue activities included in this WBS do not appear to reflect the logic interfaces with the appropriate waste generation or SNM operation activities. FY99 and FY00 there appears to be sufficient information available to show the appropriate interdependency relationship between LOE activities and the appropriate SNM Operation activities in this WAD. Appropriate interdependency relationships are needed in order to accurately determine the impact of SNM Operation changes on the LOE activities, (i.e., if SNM Operations get delayed there could be a potential impact to the LOE durations and cost). We recommend that K-H review the scope and interfaces and make the necessary 2006 CPB Schedule revisions to show the activity interdependencies.

### WAD 089 – B371 Residues Elimination Project

- Although the 2006 forecast dates for fluoride repack operations, completion of fluoride shipments to SRS and other associated work remain the same as the 2010 forecasts, the completion of Residue Stabilization has been delayed approximately four-months due to the added activity and logic for FY02 WET Combustibles Project Management.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	FY00	FY01	FY02	FY03
J9WUMILE204	IP - 317 COMPLETE REPACKAGING	0		31MAY02				
J9WUMILE189	FY02-T1 Cmpl Repack Pu Inorganics/Oxide Residues	0		31MAY02				
J9WU3206103	FY02 WET Combustibles Closure Project Management	84	03JUN02	30SEP02				
J9WUMILE039	Complete Residue Stabilization	0		30SEP02				
J9WU3206499	All WET Combustibles Ready for Shipment to WIPP	0		30SEP02				

- Additionally, it appears that the Milestone J9K2009214, IDC 393 Ready to Ship to WIPP, has slipped approximately six-months primarily due to the revised logic with an added lag of 142 work days between Activity J9K1507611, FY00 IDC 393 Operations, and Activity, J9K200HGS FY01 SS&C Head Space Gas Sampling. The basis for the lag or gap in time is unknown. We recommend that K-H explain their recovery plan for the delay shown below.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	FY00	FY01
J9K1507611	FY00 IDC 393 Operations	32	01AUG00	14SEP00		
J9K2009910	FY00 SS&C Material Surveillance Team	74	01AUG00	13NOV00		
J9K200850	FY00 SS&C SGS CALORIMETRY	75	01AUG00	14NOV00		
J9KMILE207	FY00-T2 SS&C Shipments Complete to SRS	0		30SEP00*		
J9KMILE218	IP - 314 Complete Shipping SS&C to SRS	0		30NOV00*		
J9K200HGS	FY01 SS&C Head Space Gas Sampling	40	22FEB01	02APR01		
J9K2009214	IDC 393 Ready to Ship to WIPP	0		02APR01		

- The LOE Wet Repack Operation and SS&C Commercial Shipment activities included in this WBS do not appear to reflect the logic interfaces with the appropriate waste generation or SNM operation activities. Additionally, the following support program LOE activity types also do not appear to be tied to the shipment activities.

- Operations Maintenance
- WET Combustibles Project Management
- Wet Repack Gas Generation Testing - B371
- Gas Generation Testing Engineering
- Head Space Gas Sampling
- Wet Repack SGS Drum Counting
- Wet Combustibles Cat 4 Drum Moves

For FY99 and FY00 there appears to be sufficient information available to show the appropriate interdependency relationship between LOE activities and the appropriate waste generation or operation activities in the 2006 CPB. Appropriate interdependency relationships are needed in order to accurately determine the impact of waste generation changes on the LOE activities, (i.e., if waste generation gets delayed there could be a potential impact to the LOE durations and cost). We recommend that K-H review the scope and interfaces and make the necessary 2006 CPB Schedule revisions to show the activity interdependencies.

#### **WAD 090 – Residues Program Support Project**

1. The completion of PBD 009 as represented by activity KOENDPBD09 below has been delayed approximately one-year due to the added logic to the Product Quality activities. Previously, the completion of PBD 009 was driven by the completion of the Salt Stabilization. We recommend that K-H consider revising the Milestone logic so that the Milestone activities are not driven by LOE activities.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Total Float		FY99	FY00	FY01	FY02	FY03	FY04
KOMPQ00100	FY99 PRODUCT QUALITY MANAGEMENT	254	01OCT98	30SEP99	1							
KOMPQ00150	FY00 PRODUCT QUALITY	254	01OCT99	29SEP00	1							
KOMPQ00200	FY01 PRODUCT QUALITY	253	02OCT00	28SEP01	1							
KOMPQ00300	FY02 PRODUCT QUALITY	254	01OCT01	30SEP02	1							
BSSMILE203	FY02-T2 - Complete Salt Stabilization	0		30SEP02*	0							
KOMPQ00400	FY03 PRODUCT QUALITY	254	01OCT02	30SEP03	1							
KOENDPBD09	Complete PBD 009 - Pu Solid Residue Stab Project	0		30SEP03	824							

2. The LOE Product Quality activities included in this WBS do not appear to reflect the logic interfaces with the appropriate waste generation or SNM operation activities. For FY99 and FY00 there appears to be sufficient information available to show the appropriate interdependency relationship between LOE activities and the appropriate operation activities in this WAD. Appropriate interdependency relationships are needed in order to accurately determine the impact of waste generation changes on the LOE activities, i.e. if waste generation gets delayed there could be a potential impact to the LOE durations and cost. We recommend that K-H review the scope and interfaces and make the necessary 2006 CPB Schedule revisions to show the activity interdependencies.

### Cost & Resource Loading Issues

1. The following Table lists several examples of an activity that has no Budgeted Cost associated with it in the 2006 CPB Schedule and would normally be expected to have associated cost. We recommend that K-H verify that the activity Original Durations and Budgeted Costs are accurate or make the necessary modifications to the 2006 CPB Schedule.

Activity ID	Activity Description	Original Duration	2006 CPB Schedule Budgeted Cost
B4E83CN400	Calibrate Equipment	120	\$0.00
B4E83DP200	Design Proposal Preparation	20	\$0.00
B4E83DP300	Evaluate Design Proposal	10	\$0.00
B4E83DP400	Negotiate Design Fee	10	\$0.00
B4E83DP500	Award Design Subcontract	10	\$0.00
B4E83FA100	Shop Drawing Submittals & Approval	15	\$0.00
B4E83PC200	Evaluate Construction Proposal - PACC	10	\$0.00
B4E83PC300	Negotiation Construction Subcontract - PACC	10	\$0.00
B4E83PC400	Award Construction Subcontract - PACC	10	\$0.00
B4E92PR400	Negotiation/Subcont Award - Air Bath Calor B371	5	\$0.00
B4E93PR200	Procurement/Solicitation	20	\$0.00
B4E93PR400	Negotiation/Subcontract Award	20	\$0.00
B4E99EX510	PROC-DEV-B371 Air Bath Calorimeters FY99	103	\$0.00
B4E99EX610	PROC-DEV COMB P/A Crate Counter FY99	254	\$0.00
B4E99EX810	PROC-DEV B707 Air Bath Calorimeters FY99	126	\$0.00
B5R3CN1200	Constr. for Cal/Gamma	129	\$0.00
B5R3CN8005	Cal/Gamma Training	150	\$0.00
C2NOX60356	Return Samples to 777 for Repack	2	\$0.00
C2NOX60402	TVA Shipping Schedule	5	\$0.00
C2NOX60405	Complete Paperwork	10	\$0.00
C2S0050700	eU Parts Shipment # 7 Placeholder - Make Ready	23	\$0.00
C2S0050800	eU Parts Shipment # 8 Placeholder - Make Ready	23	\$0.00
C2S0050900	eU Parts Shipment # 9 Placeholder - Make Ready	23	\$0.00
C2S0051000	eU Parts Shipment #10 Placeholder - Make Ready	23	\$0.00
C2S0051100	eU Parts Shipment #11 Placeholder - Make Ready	23	\$0.00
C2S0051200	eU Parts Shipment #12 Placeholder - Make Ready	23	\$0.00
C2S0051300	eU Parts Shipment #13 Placeholder - Make Ready	23	\$0.00
C2S0051400	eU Parts Shipment #14 Placeholder - Make Ready	23	\$0.00
J8AGROP506	FY99 - 707 PROCESS ASH RESIDUE (1000 + 7950) KGs	19	\$0.00
K0MPC01000	FY99 PHASE I - BAR CODING SYSTEM DEVEL	42	\$0.00
K0MPC01100	FY99 PHASE II - BAR CODING SYSTEM DEVEL	61	\$0.00

2. The following Table lists several examples where the budgeted cost reflected in the 2006 CPB Schedule appears to be under estimated. Assuming the Original Durations represents a continuous work effort, the Average Daily Cost appears to confirm that these are underestimated. We recommend that K-H verify that the activity Original Durations and Budgeted Costs are accurate or make the necessary modifications to the 2006 CPB Schedule.

Activity ID	Activity Description	Original Duration	Budgeted Cost	Average Daily Cost
B4E84CN210	Install Equipment FY00 - Air Bath - 707	40	\$187.08	\$4.68
B4E93PR100	Prepare Equipment Specs.	20	\$212.24	\$10.61
B4E93PR300	Proposal Submission/Tech. Eval.	26	\$424.48	\$16.33
B4E92CN200	Install Equipment - Air Bath Calorimeter B371	15	\$249.44	\$16.63
C1M5000211	Thermal Stabilization FY00	181	\$3,270.72	\$18.07
B0B0000110	MATERIAL STORAGE PLAN SNM Consol B371	62	\$1,863.20	\$30.05
C1M4000071	NEPA Review	71	\$2,150.00	\$30.28
J9W3206113	FY99 Wet Combustibles Cat 3 Drum Moves	237	\$7,691.56	\$32.45
B4E92AE200	Title III Engineering - Air Bath Calor B371	65	\$2,240.00	\$34.46
B4E75PM100	Project Management SGS FY99	151	\$5,324.13	\$35.26
B3HXM16100	Maint of PuSPs Ops Bases - SNM Holdup Rem (02)	170	\$6,600.00	\$38.82
C1M2000031	B707/777 FY99 4th Qtr HSP 31.11 Surveillance Wei	72	\$3,010.35	\$41.81
C1M3000001	Thermal Stabilization FY99	254	\$10,770.88	\$42.41
B4E93CN200	Project Accept. & Transfer	5	\$212.24	\$42.45
B3HD993100	MC&A Plan	34	\$1,720.80	\$50.61
C1M4000025	Revalidate Activity Screen	20	\$1,018.40	\$50.92

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#### 4.4.4.1 PBD016 – BUILDING 371 CLUSTER CLOSURE PROJECT

##### *Approach*

The following comments, concerns and recommendations are the result of the team's review of those portions of the 2006 Closure Project Baseline (CPB) Schedule we felt were critical to site closure as scheduled in 2006. We did not review all of the 2006 CPB Schedule assumptions, scope and sequence; we reviewed a representative set of the Work Authorization Documents (WADs) within several critical Project Baseline Descriptions (PBDs). The comments below are organized by Work Authorization Documents (WADs) and Work Breakdown Structures (WBSs) reviewed in conjunction with the B371/374 Cluster Closure. The WADs reviewed in connection with the B371/374 Cluster Closure are:

- WAD 009 B371 94-3 Safety Upgrade Project
- WAD 019 B371 Liquid Stabilization Project
- WAD 031 371 Cluster Project
- WAD 059 IAEA Project

##### *Basis & Assumption Issues*

#### **WAD 031 – 371/374 Cluster Project**

<b>K-H Project Management Plan Assumption</b>	<b>Comment</b>
1. The facility is maintained at an operability of a minimum level of 90% for required nuclear operations.	The basis for this can not be verified with the available information. It is also unclear how this is incorporated into the 2006 CPB Schedule activity Durations.
2. No major discovery issues which affect authorization basis (a USQ) or criticality safety impact the ability to perform SNM Removal/Deactivation, Decommissioning and Mission Work simultaneously.	It is unclear from the information whether SNM Removal/Deactivation, Decommissioning and Mission Work can actually be performed simultaneously.
3. Regulatory authorities approve onsite waste storage plans to support SNM and D&D operations. External stakeholders do not prevent storage in tents.	The 2006 CPB does not appear to include any contingency plans for items like these.
4. Specific D&D assumptions are included in the BOE.	The May 1999 Revision 2 of the Facility Disposition Cost Model states the schedule for facility decommissioning is based on Revision 7 of the 2006 Facility Disposition Plan ("Eye Chart"). There are discrepancies noted below (Schedule Development Issues) between the P3 electronic copy of 2006 CPB Schedule and the "Eye Chart."
5. Work required to be accelerated into FY99 to achieve closure by 2006 is funded and executed in FY99.	No comment

6. The regulatory agencies will adhere to document review schedules as described in RFCA.	It is not known at this time if the appropriate regulatory agencies have been provided K-H's forecasts for approvals and if they have accepted the approval forecasts as shown in the 2006 CPB Schedule.
7. The regulatory agencies will approve the concept of an overall IA Characterization Plan that enables site specific planning information to be added as addenda.	It is not clear from the information who will approve this Plan or what impact it will have on the schedule if it is not approved.

### ***Scope Issues***

The scope of deactivation, decommissioning, decontamination, dismantlement and demolition activities is not clearly identifiable based on the PBD for WAD 31 and the coding structure of the 2006 CPB Schedule. This issue is further explained within the Schedule Development Issues below.

### **WAD 019 – B371 Liquid Stabilization Project**

1. It appears time is not clearly identified for the engineering support packages which are the results of the room walkdowns as outlined in the section of PBD shown below. We recommend that K-H identify where time is allotted in the 2006 CPB Schedule for this deliverable or make the necessary modifications to the 2006 CPB Schedule.

*Room walkdowns (W/Ds) provide the basis for the draining procedures. W/Ds of all rooms within the twelve areas are included. After W/Ds are complete for each area, an evaluation of the area is done to identify drain points. The deliverable is an engineering support package. Based on lessons learned from B771, the evaluation activity also ended up including identification of purge/hard vacuum paths.*

### **WAD 031 – 371/374 Cluster Project**

1. It appears that the following activities are the only utility deactivations within this WAD and are therefore not forecast as outlined in the PBD. The PBD states that the deactivation of utilities will begin to occur in FY02.

*Utility Systems: No utility systems are planned to be deactivated/de-energized or removed in FY00 or FY01. Utility shutdowns will begin to occur in FY02, FY03, and will be completed in FY04.*

The activities below do not agree with this statement as they reflect Utility System Dissolution finishing by FY01. We recommend that the 2006 CPB Schedule and the PBD be brought into alignment with each other.



Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
D1Q31ST005	Set 5 B371 Utility & Dissolution - Deact/SNM Rem	123	18-Oct-00*	12-Apr-01	190
D1QEDIS170	Set 5, Utility Areas & Dissolution	130	13-Apr-01	16-Oct-01	1,015
D1QEDIS175	Set 5, Utility Areas & Dissolution	15	17-Oct-01	6-Nov-01	1,015

\* asterisk indicates manually constrained date

### ***Schedule Development Issues***

It is noted that the following activities within WAD 031 do not appear to meet K-H's Standard 10 Scheduling requirement:

*A. Activity Durations/Level of Detail. Current FY activities and FY+1 activities will generally be two working weeks to three months in duration, except for procurement, regulatory actions, or level-of-effort activities, which do not have intermediate points for performance measurement. Longer term durations for true level-of-effort activities are permissible. Activities scheduled from FY+2 through completion will have durations reflecting the level of scope development.*

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
D1Q0299M20	Remove Combustible Materials from B371 Rm2327	111	26-Apr-99	30-Sep-99	1
D1Q0299M30	Strip out Decontaminate B371 224 Plenum	134	22-Mar-99	28-Sep-99	255
D1Q31CT300	B371 Cooling Tower Construction Installation	120	15-Mar-00	31-Aug-00	1
D1Q31DR010	B371 Label Active Piping and Systems	218	22-Nov-99	29-Sep-00	190
D1Q31ST002	Set 2 B371 Main Aqueous Process - Deact/SNM Rem	334	1-Oct-99	25-Jan-01	12
D1Q31ST003	Set 3 B371 Mission Specific - Deact/SNM Rem	421	18-Jan-00	11-Sep-01	12
D1QSS00A05	Strip out Decontaminate B371 Room 1111	190	1-Oct-99	29-Jun-00	64
D1QSS00A10	B371 Disposition of Crates as Waste	190	1-Oct-99	29-Jun-00	64

This creates a concern for the schedule accuracy based on the level of detail as reflected by the activity durations. We recommend that K-H review the Standard 10 requirement and the 2006 CPB Schedule exceptions and make the necessary modifications to the 2006 CPB Schedule.

### **WAD 009 – Safety Upgrade Project**

#### **1.1.04.07.01.02 – B371 Near Term Safety Upgrades**

1. It appears that the following activities representing facility upgrades were deleted from the 2010 CPB Schedule to accelerate the completion of the PBD 004 SNM Capital Support Project by three years. The basis for the deleted scope is unknown and we recommend that K-H confirm that this scope is no longer required or identify where the scope has been incorporated into other 2006 CPB Schedule activities.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
A9E12CNH20	Mitigate SQUG Findings, Const., FY00	127	1-Oct-99	31-Mar-00	128
A9E12PM122	Project Management Support, Capital FY00	254	1-Oct-99	29-Sep-00	1
A9E12CNH60	1101/1208 Storage Rack, Const., FY00	126	1-Nov-99*	28-Apr-00	108
A9E12CNH40	1101/1208 Ceiling, Const., FY00	107	1-Dec-99*	1-May-00	107
A9E12CN225	Cooling Tower Replacement, Procurement FY00	65	1-Feb-00*	1-May-00	107
A9E12CN226	Cooling Tower Replacement, Const. FY00	150	1-Mar-00*	29-Sep-00	1
A9E12CNH42	1101/1208 Ceiling, Const., FY01	253	2-Oct-00	28-Sep-01	1
A9E12CNH62	1101/1208 Storage Rack, Const., FY01	253	2-Oct-00	28-Sep-01	1
A9E12PM124	Project Management Support, Capital FY01	253	2-Oct-00	28-Sep-01	1
A9E12CNH64	1101/1208 Storage Rack, Const., FY02	254	1-Oct-01	30-Sep-02	0
A9E12PM126	Project Management Support, Capital FY02	254	1-Oct-01	30-Sep-02	0
A0ENDPBD04	Complete PBD 004 - SNM Capital Support Project	0		30-Sep-02	2,033

\* asterisk indicates manually constrained date

2. We note that the B371 Upgrades included in WAD 009 appear to be manually constrained as opposed to being driven by the predecessor logic or activities with durations for the upgrade activity. Activity A9ECPM0401, B371 Upgrades Phase II-N2 mods, is tied (with a start to finish relationship) to Activity A9BEGWAD09, Begin WAD 009 - SNM Capital Support Project forecast to start October 1, 1998 but Activity A9ECPM0401 is constrained to complete February 24, 1999. The constraints override the logic relationships. Similarly this is true for Activities A9E12CN932, A9ECPM0402, A9ECPM0403, A9E12CN934. Additionally, it appears that Activity A9ECPM0404, B371 Upgrades Phase III- Interim Storage Upgrade, is constrained to complete September 30, 1999 when the predecessor logic would allow the activity to complete two months earlier on July 30, 1999 if not earlier. K-H has stated that this work is complete at this time. The basis for these constraints is unknown. We recommend that the constraints be explained and replaced with appropriate logic relationships if necessary.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
A9E12CN932	Fire Walls (SC-3,Ext.,S/R,&Vault), Des., FY99	63	4-Jan-99*	31-Mar-99	43
A9ECPM0401	B371 Upgrades Phase II-N2 mods	0		24-Feb-99*	0
A9ECPM0402	B371 Upgrades Phase II - Zone 3 HVAC	0		24-Feb-99*	0
A9ECPM0403	B371 Upgrades Phase II - Fine Barriers	0		24-Feb-99*	0
A9E12CN934	Fire Walls (SC-3,Ext.,S/R,&Vault), Const., FY99	85	1-Apr-99*	30-Jul-99	43
A9E12CN930	CPM-019 Upgrd Vault/ SC3 fire wall Const Sub Cmp	0		30-Jul-99	43
A9ECPM0404	B371 Upgrades Phase III- Interim Storage Upgrade	0		30-Sep-99*	0

\* asterisk indicates manually constrained date

**WAD 019 – B371 Liquid Stabilization Project****1.1.04.09.03.02.05 – Building 371 Decontamination**

1. It appears that the Activities within WBS 1.1.04.09.03.02.05 – Building 371 Decontamination are not tied to the Activities within 1.1.04.09.03.02.01 – Building 371 Tap and Drain or 1.1.04.09.03.02.03 – Building 371 Walkdowns activities; thus indicating that the walkdowns could possibly be performed within a contaminated area. Additionally, the following activities are manually constrained as opposed to being driven by the appropriate logic relationships. (K-H did indicate that in order to accelerate the evaluation process, walkdowns may have been performed in contaminated areas.)

Activity ID	Activity Description	Original Duration	Early Start	Early Finish
B9KDM0120	Decon Support Rm 1117 ( Area 12B - Canyon)	55	15-Oct-98*	5-Jan-99
B9KDM0411	Decon Rm 3547 (Area 2B)	59	2-Nov-98*	27-Jan-99
B9KDM0201	Decon Support Rm 2317 (Area 8)	45	21-Dec-98*	23-Feb-99
B9KDM0161	Decon Support Rms 1107,1109,1127 (Area 12A)	45	25-Jan-99*	26-Mar-99
B9KDM0821	Decon Support Rm 3529 (Area 6)	56	8-Feb-99*	26-Apr-99

\* asterisk indicates manually constrained date

Although these activities are reported complete, we recommend that the 2006 CPB Schedule reflect the necessary logic, (not constraints), where feasible to achieve proper sequencing of the scope of work.

**WAD 025 – Industrial Zone Clusters Project****1.1.05.07.04.01 – Building 367 Decommissioning, 371T Cluster**

1. The 2006 CPB Schedule includes the following activities related to the Building 367 decommissioning:

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
C53670APEN	B367 Decommissioning Planning & Engineering	103	1-Oct-03	26-Feb-04	317
C53670BCHR	B367 Decommissioning Characterization	233	1-Oct03	30-Aug-04	338
C53670GPMG	B367 Decommissioning Project Management	254	1-Oct03	29-Sep-04	317
C53670HSUS	B367 Decommissioning Site Support	254	1-Oct03	29-Sep-04	317
C53670CSPR	B367 Decommissioning Site Preparation	23	27-Feb04	30-Mar-04	338
C53670DDEC	B367 Decommissioning Decontamination	84	31-Mar-04	28-Jul-04	338
C53670EDIS	B367 Decommissioning Dismantlement	84	31-Mar-04	28-Jul-04	338
C53670FDEM	B367 Decommissioning Demolition & Disposal	23	29-Jul-04	30-Aug-04	338

However, Buildings T371A, T371C, T371D, T371E, T371F only include the following activities:

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
C5371AAPEN	B371A Decommissioning Planning & Engineering	126	1-Oct-03	30-Mar-04	317
C5371ABCHR	B371A Decommissioning Characterization	233	1-Oct-03	30-Aug-04	338
C5371AGPMG	B371A Decommissioning Project Management	254	1-Oct-03	29-Sep-04	317
C5371AHSUS	B371A Decommissioning Site Support	254	1-Oct-03	29-Sep-04	317
C5371AFDEM	B371A Decommissioning Demolition & Disposal	107	31-Mar-04	30-Aug-04	338

It appears that time is not clearly identified for site preparation (decontamination is not required since these buildings are identified as trailers) and dismantlement. K-H has stated that site preparation and dismantlement are not required for trailers. We recommend that K-H review the activity durations since they appear excessive for Type 1 demolition.

2. We also note that decontamination and dismantlement activities for Building 376 are sequenced concurrently as shown above. We recommend that the sequencing and duration of this work as reflected in the 2006 CPB Schedule be reviewed to ensure that it reflects safe and reasonable practices.

### **WAD 031 – 371 Cluster Project**

#### **1.1.06.02.03 – 371/374 Cluster Deactivation**

1. The following activities are driven by Activity D1QDEACST1, Start 371 Cluster Deactivation and tied to each other as opposed to being tied to other ongoing SNM operations such as the Caustic Waste Treatment System (CWTS) operation in Set 4 and the deactivation activities with the same set.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
D1Q31DR001	B371 Set 1 Eval/Prep/Drain Non-actinide Liquids	36	1-Oct-99	19-Nov-99	100
D1Q31ST002	Set 2 B371 Main Aqueous Process - Deact/SNM Rem	334	1-Oct-99	25-Jan-01	12
D1Q31DR02A	B371 Set 2a Eval/Prep/Drain Non-actinide Liquids	49	12-Oct-99	21-Dec-99	100
D1Q31DR02B	B371 Set 2b Eval/Prep/Drain Non-actinide Liquids	50	22-Nov-99	3-Feb-00	266
D1Q31DR006	B371 Set 6 Eval/Prep/Drain Non-actinide Liquids	34	17-Jan-00	2-Mar-00	266
D1Q31DR04A	B371 Set 4a Eval/Prep/Drain Non-actinide Liquids	49	24-Jan-00	30-Mar-00	266
D1Q31DR04B	B371 Set 4b Eval/Prep/Drain Non-actinide Liquids	40	3-Mar-00	27-Apr-00	266
D1Q31DR05A	B371 Set 5a Eval/Prep/Drain Non-actinide Liquids	37	5-Apr-00	25-May-00	266
D1Q31DR05B	B371 Set 5b Eval/Prep/Drain Non-actinide Liquids	42	2-May-00	29-Jun-00	266

As reflected in the forecast dates for Set 4, the CWTS operation is ongoing at the same time as the Eval/Prep/Drain Non-actinide Liquids. Similarly, for Set 2 the deactivation work is forecast for October 1, 1999 through January 25, 2001, concurrent with Eval/Prep/Drain Non-actinide Liquids. It is not clear if such work can be scheduled concurrently. We

recommend that K-H review the sequencing of the Eval/Prep/Drain Non-actinide Liquids, SNM operations and deactivation activities to ensure that the necessary interface logic is reflected in the 2006 CPB Schedule.

2. We note that Activity D1Q31DR010, B371 Label Active Piping and Systems is logically tied and begins subsequent to the finish of Activity D1Q31DR001, B371 Set 1 Eval/Prep/Drain Non-actinide Liquids. It appears the labeling activity should begin concurrently or before evaluation. We recommend that the sequencing of this work be reviewed to ensure that it reflects safe and reasonable practices.
3. The basis of constraining the start of Activity D1QSSDA010, B371 Deactivation Hiring/Training/Clearances to April 26, 1999 is unknown. We also note that Activity D1Q31TRN10, B371 Training Liquids Team for Deactivation is not logically tied to Activity D1QSSDA010. Currently the Activity is driven only by Activity D1Q31DR010, B371 Label Active Piping and Systems. We recommend that K-H review the logic relationships for the hiring and training sequence so all appropriate relationships are represented (i.e., it appears that Training Liquids Team for Deactivation could begin prior to completing Hiring/Training/Clearances).
4. Activity D1Q31ST001, B371 Set 1 Attic & Chem Makeup - Deactivation, is manually constrained to begin on October 2, 2000 when the activity's predecessor logic (Activity D1Q31DR001, B371 Set 1 Eval/Prep/Drain Non-actinide Liquids) would otherwise allow a November 20, 1999 start, nearly 12 months earlier. The basis for this constraint is unknown. We recommend that the constraint be explained and replaced with appropriate logic if necessary.
5. The following activities appear to represent the ("administrative") process for closing the MAA for 371/374 Cluster. We also note that DOE's involvement/approval is not clearly identified. We recommend that K-H identify where time is allotted for DOE's activity or make the necessary modifications in the 2006 CPB Schedule.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
D1Q01CL100	Develop Plan for Closing MAA	38	2-Oct-00	22-Nov-00	226
D1Q01VA100	Vulnerability Analysis	96	27-Nov-00	11-Apr-01	226
D1Q01CL130	Complete Analysis of Scan Data	83	12-Apr-01	8-Aug-01	226
D1Q02VW10	Final Facility Scan/MAA Closure Activities	64	1-Jul-02	30-Sep-02	0
D1QMILE303	Comp CAT I/II Holdup Removal/Close B371/374 MAA	0		30-Sep-02	0

### 1.1.06.02.04.02 – Building 371 Decommissioning, 371/374 Cluster

1. We note that the following activities are constrained to start approximately two years after their predecessor logic completes.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
D1QEDIS120	Set 3, Process Areas (as available)	255	1-Oct-03*	30-Sep-04	214
D1QEDIS130	Set 6, Fluorination Area	146	24-Oct-03*	20-May-04	169

\* asterisk indicates manually constrained date

The basis for these constraints is unknown, though K-H states these constraints are due to funding. We recommend that K-H explain the reason for the constraints and replace with appropriate logic if necessary.

2. We note that the following activities are constrained to start approximately 1.5 years after their predecessor logic completes.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
D1QEDIS180	Set 10, Process PuSPS, Room 3701	165	1-Oct-04*	25-May-05	116
D1QEDIS140	Set 8, Labs, Vaults, Process Areas	177	1-Oct-04*	13-Jun-05	77

\* asterisk indicates manually constrained date

The basis for these constraints is unknown, though K-H states these constraints are due to funding. We recommend that K-H explain the reason for the constraints and replace with appropriate logic if necessary.

### 1.1.06.02.04.03 – Building 373 Decommissioning, 371/374 Cluster

1. The following activities are driven by Activity D1Q716FDEM, B371 Decommissioning Demolition/Disposal FY06 as opposed to activities within B373. The basis for the logic relationship is unknown, though K-H has stated this logic was applied in order for the decommissioning and demolition of these items to occur concurrently. Additionally, we note that all the activity durations are the same for the following activities (excluding 373CT, the budgeted costs are also in the same range) and B378 is documented as a Type-2 building. We recommend that K-H explain the reason for the ties to B371, review the activity duration and budgeted cost for B378 and make the necessary revision to the 2006 CPB Schedule.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Budgeted Cost
D1Q373X650	373CT Decommissioning Demolition	23	29-Nov-05	30-Dec-05	\$16,000
D1Q374A650	B374A Decommissioning Demolition	23	29-Nov-05	30-Dec-05	\$20,555
D1Q377X650	B377 Decommissioning Demolition	23	29-Nov-05	30-Dec-05	\$ 3,544
D1Q378X650	B378 Decommissioning Demolition	23	29-Nov-05	30-Dec-05	\$ 3,805
D1Q384X650	B384 Decommissioning Demolition	23	29-Nov-05	30-Dec-05	\$ 4,800

### 1.1.06.02.04.04 – Building 374 Decommissioning, 371/374 Cluster

- Building 374 Decommissioning includes only the following activities as opposed to those similar to other buildings within this cluster closure project (including planning & engineering, characterization, project management, support services, site prep, decontamination and demolition). We recommend K-H clearly identify where time is allotted for this scope and make the necessary modifications to the 2006 CPB Schedule.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
D1QEDIS560	Set 7, B374 Dismantlement	85	1-May-03	29-Aug-03	126
D1Q744EDIS	Set 7, B374 Dismantlement	255	2-Sep-03	31-Aug-04	126
D1Q745EDIS	Set 7, B374 Dismantlement	254	1-Sep-04	31-Aug-05	126
D1Q746FDEM	B374 Decommissioning Demolition FY06	60	4-Oct-05	29-Dec-05	104

### 1.1.06.02.06 – B371/374 Deactivation, 371/374 Cluster

- The Activities listed in the table below are forecast to complete subsequent to September 30, 2002, and total more than \$1 million in Budgeted Cost.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float	Budgeted Cost
D1Q31ST013	Set 13 Remaining Ventilation - Deactivation	40	9-Sep-02	1-Nov-02	166	\$ 76,606.75
D1Q31ST016	Set 16 B371 Cluster Ancillary Bldgs	61	1-Oct-02	27-Dec-02	624	\$ 76,023.35
D1Q31ST012	Set 12 Hallway/Stairwell/MCC - Deactivation	30	30-Dec-02	10-Feb-03	715	\$ 76,023.35
D1Q31ST007	Set 7 B374 - Deactivation	84	3-Jan-03	30-Apr-03	126	\$ 888,223.14
D1Q31ST014	Set 14 B371 Cluster Outside Tnks - Deactivation	30	1-May-03	12-Jun-03	587	\$ 76,023.35
<b>TOTAL</b>						<b>\$1,040,269.84</b>

As shown below in the P3 image below, (1), the Milestone for Complete CATI/II Holdup Removal/Close B371/374 MAA (September 30, 2002) is approximately 9 months prior to the forecast completion of the B371 Initial Physical Deactivation in June 2003. Additionally, as noted below, (2), there will still be several activities requiring SNM stabilization forecast through September 25, 2005 (Milestone inaccurately reflects September 9, 2005). There is a potential concern of closing the MAA when an unacceptable amount of SNM remains in the building. We note that DOE's approval/involvement is not clearly identified for the MAA Closure activities. We recommend that K-H identify where time is allotted for DOE's involvement and make the necessary modifications to the 2006 CPB Schedule.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	FY01	FY02	FY03	FY04	FY05	FY06
+RBD1	DEACTIVATION PLANNING									
		520	01OCT98	17OCT00						
+RBD4	B371 Drain Non-actinide Liquids									
		693	01OCT99	24JUN02						
+RBD5	B371 INITIAL PHYSICAL DEACTIVATION									
		939	01OCT99	12JUN03						
+RBD7	B371 DEACTIVATION CLOSEOUT									
		570	13JUN03	09SEP05						
+RBD8	SNM MATERIAL CLOSEOUT									
		2,171	01OCT99	09SEP05						

2. The 2006 CPB Schedule noted that the Completion of SNM Stabilization and Packaging Complete is forecast for June 28, 2002, and there is an Activity (DIQSNMA100 Evaluation of Method for SNM Removal after PuSPS) to address the processing of these materials through September 25, 2005 subsequent to the closure of the PuSPS. We note that DOE's approval/involvement is not clearly identified for the alternative SNM processing method activities. We recommend that K-H identify where time is allotted for DOE's involvement and make the necessary modifications to the 2006 CPB Schedule.

3. The following milestone dates appear in the 2006 CPB Schedule:

- B371 Cluster Deactivation Closeout September 2005
- B371 Initial Physical Deactivation June 2003
- MAA Closure September 2002

We note that the driving logic for completing Deactivation includes all the decommissioning activities that could potentially uncover more SNM. These activities are shown below. We recommend that K-H verify that the assumptions to close the MAA with the amount of outstanding deactivation work as reflected in the 2006 CPB Schedule are reasonable and are in accordance with DOE's assumptions.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float	Budgeted Cost
DIQEDIS250	Set 12, Halls, Stairs, MCC	60	26-May-05	19-Aug-05	132	\$ 0
DIQEDIS245	Set 13A/B Plenum Dismantlement	62	14-Jun-05	9-Sep-05	77	\$ 2,022,108
DIQEDIS160	Set 13A, Z2 & Z3 Vent, System 2	75	14-Jun-05	28-Sep-05	105	\$ 4,429,375
DIQEDIS240	Set 13B, Remaining Vent	76	26-May-05	13-Sep-05	116	\$ 2,022,108
DIQEDIS210	Set 15, Exterior Offices	100	1-Oct-04	23-Feb-05	386	\$ 0
DIQEDIS220	Set 16, Ancillary Buildings	100	1-Apr-05	22-Aug-05	153	\$ 0
DIQEDIS125	Set 3, Process Areas (as available)	143	1-Oct-04	25-Apr-05	214	\$ 4,834,087
DIQEDIS130	Set 6, Fluorination Area	146	24-Oct-03*	20-May-04	169	\$ 4,076,585
DIQEDIS157	Set 4, CWTS & CSV FY04	150	1-Oct-03	3-May-04	462	\$ 5,396,401
DIQEDIS180	Set 10, Process PuSPS, Room 3701	165	1-Oct-04*	25-May-05	116	\$ 48,012
DIQEDIS140	Set 8, Labs, Vaults, Process Areas	177	1-Oct-04*	13-Jun-05	77	\$ 2,512,505
DIQEDIS120	Set 3, Process Areas (as available)	255	1-Oct-03*	30-Sep-04	214	\$ 6,470,708
<b>TOTAL</b>						<b>\$31,811,891</b>

\* asterisk indicates manually constrained date



4. It appears that the Sand/Slag and Crucible Operations completion (Activity J9KMILE218, IP - 314 Complete Shipping SS&C to SRS) is not directly tied to the deactivation and decommissioning of Set 8 (room 3602) where the Sand/Slag and Crucible Operation exists through November 30, 2000. Similarly, the Wet Repack Operations in room 3206 (J9W3206276, FY01 Rm 3206 Wet Rpk Ops 2nd Shift) continue through May 31, 2001 and the deactivation activity (Activity D1Q31ST003, B371 Set 3 Mission Specific - Deact/SNM Rem) for the same area is forecast for January 18, 2000 through September 11, 2001. The figure below shows the referenced operations and deactivation activities. It appears that due to the lack of direct logic ties between operations (or logic causing concurrency) and deactivation activities there are overlapping activities which may be in conflict. We recommend that K-H confirm that there are no conflicts between operations and deactivation as well as added the appropriate logic to the 2006 CPB Schedule.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Total Float	FY99	FY00	FY01
1.1.04.09.04.02	RESIDUE STABILIZATION PROGRAM - WET COMB							
J9W3206276	FY01 Rm3206 Wet Rpk Ops 2nd Shift - 991KG	169	02OCT00	31MAY01	0			
1.1.04.09.04.08	SAND/SLAG AND CRUCIBLE OPERATIONS							
J9KMILE218	IP - 314 Complete Shipping SS&C to SRS	0		30NOV00*	857			
1.1.06.02.03	371/374 CLUSTER DEACTIVATION							
D1Q31ST003	Set 3 B371 Mission Specific - Deact/SNM Rem	421	18JAN00	11SEP01	12			
D1Q31ST008	Set 8 B371 Lab/Vault/Process - Deact/SNM Removal	88	25MAY01	28SEP01	190			

5. We note that the 2006 CPB Schedule includes three similar activities for the deactivation of the PuSPS and the associated Set. It appears that the cost shown in the 2006 CPB Schedule is underestimated. We recommend that K-H verify the budgeted costs as shown in the 2006 CPB Schedule associated with the deactivation of the PuSPS.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float	Budgeted Cost
B3HPUSPSD2	PuSPS - Packaging - Deactivate/Decontaminate (02)	57	1-Jul-02	30-Sep-02	0	\$51,996
D1Q31ST010	Set 10 B371 Process/PuSPS - Deact/SNM Removal	30	1-Jul-02	12-Aug-02	3	\$80,672
D1QEDIS180	Set 10, Process PuSPS, Room 3701	165	1-Oct-04*	25-May-05	116	\$48,012

\* asterisk indicates manually constrained date

6. The definition and scope of "D&D" and decommissioning appears to vary across WADS. The following PBD description (portion of) for PBD 016, WBS 1.1.06.02.04, 371/374 Decommissioning, is a direct extract from the K-H Project Management Plan:

*Demolition (emphasis added) includes the demolition of the roof, non-structural and structural components, slabs on grade, foundations or tunnel structures within three (3) feet of surrounding grade and, connecting structures (breezeways, overhead walkways, etc.) of the building/structure undergoing demolition and disposal of clean demolition debris. It also includes the packaging, pre-certification and movement to an identified pickup point; (i.e., building loading dock, etc.), of contaminated wastes generated during the decommissioning effort.*

“Cluster Decommissioning” appears to translate to demolition in this case. However, earlier in PBD 016 under Section 2.1, Purpose and Justification, decommissioning is defined as follows:

*Decommissioning: Those activities occurring after deactivation including surveillance and maintenance, decontamination, dismantlement of the facilities within the cluster.*

Not only does this create an inconsistency relative to the scope of an activity, but it also creates concern relative to the concurrency of operations, deactivation and decommissioning in close proximity. We recommend that K-H review the 2006 CPB Schedule to ensure that the Activity Descriptions accurately describe the scope of the deactivation and D&D work.

7. Figures A, B & C show a summary of Decommissioning Activities for B371 and B374 (“X” indicates activity in 2006 CPB Schedule). It appears that the B371 dismantlement activities may be those described in detail within WBS 1.1.06.02.04.02, Bldg 371 Decommissioning, 371/374 Cluster. However, this is unclear based on the definition of Decommissioning given in the PBD as outlined above. Additionally, it appears that the activities for decontamination FY03 through FY05 and Dismantlement FY05 of B374 are either missing or included elsewhere. The inconsistency in 2006 CPB Schedule activities and the PBD description give rise to concerns relative to missing scope. (Shaded areas in tables represent areas of concern) We recommend K-H review the scope of B371 as reflected in the 2006 CPB Schedule and verify that it is complete and accurately reflected.

Building 371 Activity	FY00	FY01	FY02	FY03	FY04	FY05	FY06
Decommissioning Planning & Engineering	X	X	X	X	X	X	
Decommissioning Characterization	X	X	X	X	X	X	
Decommissioning Project Management	X	X	X	X	X	X	
Decommissioning Support Services		X	X	X	X	X	
Decommissioning Site Prep			X	X	X	X	
Decommissioning Decontamination					X	X	
Decommissioning Dismantlement							
Decommissioning Demolition							X

(K-H has stated that the Building 371 dismantlement activities are included in the Sets in WBS 1.1.06.02.04.02, Building 371 Decommissioning)

Figure A

Building 374 Activity	FY00	FY01	FY02	FY03	FY04	FY05	FY06
Decommissioning Planning & Engineering				X	X	X	
Decommissioning Characterization				X	X	X	
Decommissioning Project Management				X	X	X	
Decommissioning Support Services				X	X	X	
Decommissioning Site Prep				X	X	X	
Decommissioning Decontamination							
Decommissioning Dismantlement				X	X		
Decommissioning Demolition							X

(K-H has stated that the Building 371 decontamination activities are included in the Sets in WBS 1.1.06.02.04.02, Building 371 Decommissioning)

Figure B

Building 374A Activity	FY00	FY01	FY02	FY03	FY04	FY05	FY06
Decommissioning Planning & Engineering						X	
Decommissioning Characterization						X	
Decommissioning Project Management						X	
Decommissioning Support Services						X	
Decommissioning Site Prep						X	
Decommissioning Decontamination						X	
Decommissioning Dismantlement						X	
Decommissioning Demolition							X

Figure C

8. We note that the D1QMILE436, B371/374 Cluster Complete IHSS/IBC Remediation is now forecast to complete April 24, 2006, approximately 14 months earlier than the 2010 forecast of July 13, 2007. We recommend that K-H review the reduced scope of the IHSS activities and confirm that the duration of this work reflected in the 2006 CPB Schedule is reasonable based on current knowledge and DOE's expectations.

### *Cost & Resource Loading Issues*

#### **WAD 019 – B371 Liquid Stabilization Project**

##### **1.1.04.09.03.02.01 – Building 371 Tap and Drain**

1. The following average daily labor and non-labor budget costs were reflected in the 2006 CPB Schedule. The "Area" descriptions and the necessary details were not provided at this time to support the ranges of costs between areas.

Activity ID	Activity description	Original Duration	Early Start	Early Finish	Average Daily Labor \$	Average Daily Non Labor \$
B9KBM0651	Prep to Drain - Area 5	19	1-Oct-98	27-Oct-98	\$1,232	\$1,468
B9KBM0811	Prep to Drain - Area 10	8	1-Oct-98	12-Oct-98	\$1,645	\$1,959
B9KBM0591	Prep to Drain - Area 7	15	19-Oct-98	6-Nov-98	\$ 931	\$1,098
B9KBM0540	Prep to Drain - Area 11	37	9-Nov-98	04-Jan-99	\$ 518	\$ 163
B9KBM0530	Prep to Drain - Area 8	50	3-Dec-98	12-Feb-99	\$ 540	\$ 144
B9KRM1255	Prep to Drain - Area 13	25	16-Dec-98	21-Jan-99	\$ 118	\$ 140
B9KBM0262	Prep to Drain - Area 2A	13	5-Jan-99	21-Jan-99	\$2,710	\$ 652
B9KBM0450	Prep to Drain - Area 9	26	15-Jan-99	19-Feb-99	\$1,278	\$ 310
B9KBM0820	Prep to Drain - Area 12A	23	29-Jan-99	2-Mar-99	\$1,493	\$ 310
B9KBM0262B	Prep to Drain - Area 2B	34	17-Feb-99	5-Apr-99	\$1,132	\$ 235
B9KBM0820B	Prep to Drain - Area 12B	33	22-Mar-99	5-May-99	\$ 804	\$ 166
B9KBM0490	Prep to Drain - Area 6	23	14-Apr-99	14-May-99	\$ 961	\$ 198

**Average Daily Labor Range**

**\$118 - \$2,710**

**Average Daily Non-Labor Range**

**\$140 - \$1,959**

Activity ID	Activity description	Original Duration	Early Start	Early Finish	Average Daily Labor \$	Average Daily Non Labor \$
B9KRMT821	Drain - Area 10	6	13-Oct-98	20-Oct-98	\$7,248	\$8,633
B9KRMT549	Drain - Area 11	16	16-Dec-98	8-Jan-99	\$ 542	\$ 811
B9KRMT830	Drain - Area 12A	31	19-Feb-99	2-Apr-99	\$ 825	\$1,136
B9KRMT830B	Drain - Area 12B	25	14-Apr-99	18-May-99	\$ 852	\$1,145
B9KRMT260	Drain - Area 2A	19	11-Jan-99	4-Feb-99	\$1,336	\$2,017
B9KRMT260B	Drain - Area 2B	26	15-Mar-99	19-Apr-99	\$1,460	\$2,189
B9KRMT670	Drain - Area 5	11	4-Nov-98	18-Nov-98	\$3,681	\$5,042
B9KRMT499	Drain - Area 6	17	5-May-99	27-May-99	\$ 721	\$ 962
B9KRMT600	Drain - Area 7	20	9-Nov-98	8-Dec-98	\$2,460	\$2,930
B9KRMT550	Drain - Area 8	17	18-Feb-99	12-Mar-99	\$1,044	\$1,570
B9KRMT460	Drain - Area 9	19	3-Feb-99	1-Mar-99	\$1,263	\$1,911

**Average Daily Labor Range** **\$542 - \$7,248**  
**Average Daily Non-Labor Range** **\$811 - \$8,633**

(K-H indicated during staff interviews that these budget costs may have been over estimated based on recorded actual costs.)

2. The following average daily labor and non-labor budget costs are reflected in the 2006 CPB Schedule. The "Area" descriptions and the necessary details were not provided at this time to support the ranges of costs between areas.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Average Daily Labor \$	Average Daily Non Labor \$
B9KDM0411	Decon Rm 3547 (Area 2B)	59	2-Nov-98*	27-Jan-99	\$ 459	\$ 1,184
B9KDM0481	Decon Rm 3549 (Area 2B)	3	1-Oct-98	5-Oct-98	\$8,044	\$23,865
B9KDM0260A	Decon Rm 3553 (Area 2B)	69	16-Nov-98	24-Feb-99	\$ 393	\$ 1,167
B9KDM0620A	Decon Rm 3555 (Area 2B)	75	9-Dec-98	25-Mar-99	\$ 494	\$ 1,532

\* asterisk indicates manually constrained date

We note that rooms 3553 and 3549 appear similar in size on the Building 371 Closure Planning Sequence dated 4/15/99 and yet the activity duration for room 3549 is significantly shorter than that for room 3553 which causes the Average Daily \$ to increase significantly. It is unclear from the information whether the scope of work within each space is similar. (K-H indicated during staff interviews that these budget costs may have been over estimated based on recorded actual costs.)

**Average Daily Labor Range** **\$459 - \$8,044**  
**Average Daily Non-Labor Range** **\$1,167 - \$23,865**

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Average Daily Labor \$	Average Daily Non Labor \$
B9KDM0120	Decon Support Rm 1117 (Area 12B - Canyon)	55	15-Oct-98*	5-Jan-99	\$241	\$1,181
B9KDM0201	Decon Support Rm 2317 (Area 8)	45	21-Dec-98*	23-Feb-99	\$282	\$ 618
B9KDM0821	Decon Support Rm 3529 (Area 6)	56	8-Feb-99*	26-Apr-99	\$ 11	\$ 27
B9KDM0490	Decon Support Rm 3531 (Area 6)	57	12-Feb-99	3-May-99	\$106	\$1,190
B9KDM0161	Decon Support Rms 1107,1109,1127 (Area 12A)	45	25-Jan-99*	26-Mar-99	\$633	\$2,266
B9KDM0140	Decon Support Rms 1125 and 2327 (Area 12B Canyon)	70	6-Jan-99	13-Apr-99	\$378	\$ 929

\* asterisk indicates manually constrained date

**Average Daily Labor Range**

**\$11 - \$633**

**Average Daily Non-Labor Range**

**\$27 - \$2,266**

It appears that room 3529 is significantly smaller than the other areas represented by the above activities and yet Activity B9KDM0821 has a similar duration. We also note that the average daily costs are significantly lower than those shown here. It is unclear from the information whether the scope of work within each space is similar. (K-H indicated during staff interviews that these budget costs may have been over estimated based on recorded actual costs.)

- The following activities have an Average Daily Cost range of \$0 to \$5,762.13. Assuming the Original Durations represent a continuous work effort, we recommend that K-H verify the accuracy of the Budget Costs and Original Durations for these activities shown within the 2006CPB Schedule.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Budgeted Cost	Average Daily Cost
D1QEDIS560	Set 7, B374 Dismantlement	85	1-May-03	29-Aug-03		
D1Q744EDIS	Set 7, B374 Dismantlement	255	2-Sep-03	31-Aug-04	\$ 975,721.03	\$3,826.36
D1Q745EDIS	Set 7, B374 Dismantlement	254	1-Sep-04	31-Aug-05	\$1,463,579.80	\$5,762.13

- The following Table lists several examples where the budgeted cost reflected in the 2006 CPB Schedule appears to be under estimated. Assuming the Original Durations represents a continuous work effort, the Average Daily Cost appears to confirm that these are underestimated. We recommend that K-H verify that the activity Original Durations and Budgeted Costs are accurate or make the necessary modifications to the 2006 CPB Schedule.

Activity ID	Activity Description	Original Duration	Budgeted Cost	Average Daily Cost
D1Q31DROG1	Obtain State Approval to Store Freon Bottles	70	\$0.00	\$0.00
D1QEDIS210	Set 15, Exterior Offices	100	\$0.00	\$0.00
D1QEDIS220	Set 16, Ancillary Buildings	100	\$0.00	\$0.00
D1QEDIS250	Set 12, Halls, Stairs, MCC	60	\$0.00	\$0.00
D1QEDIS560	Set 7, B374 Dismantlement	85	\$0.00	\$0.00
D1Q377X450	B377 Decommissioning Decontamination	85	\$230.59	\$2.71
D1Q378X450	B378 Decommissioning Decontamination	85	\$233.93	\$2.75
D1Q377X850	B377 Decommissioning Support Services	233	\$806.95	\$3.46
D1Q377X250	B377 Decommissioning Characterization	211	\$979.65	\$4.64
D1Q377X750	B377 Decommissioning Project Management	233	\$1,209.86	\$5.19
D1Q377X150	B377 Decommissioning Planning & Engineering	104	\$576.13	\$5.54
D1Q378X150	B378 Decommissioning Planning & Engineering	104	\$997.54	\$9.59
D1Q01CL130	Complete Analysis of Scan Data	83	\$815.52	\$9.83
D1Q378X750	B378 Decommissioning Project Management	233	\$2,660.13	\$11.42
D1Q170T950	Tank TK170 Decommissioning (SET 14)	253	\$2,914.28	\$11.52
D1Q378X850	B378 Decommissioning Support Services	233	\$3,023.73	\$12.98
D1Q384X250	B384 Decommissioning Characterization	211	\$2,879.90	\$13.65
D1Q371H850	B371H Decommissioning Support Services	230	\$3,239.76	\$14.09
D1Q371I850	B371I Decommissioning Support Services	230	\$3,239.76	\$14.09
D1Q378X250	B378 Decommissioning Characterization	211	\$3,182.42	\$15.08
D1Q377X350	B377 Decommissioning Site Prep	22	\$345.71	\$15.71
D1Q166T950	Tank TK166 Decommissioning (SET 14)	253	\$4,194.37	\$16.58
D1Q371H250	B371H Decommissioning Characterization	233	\$3,959.79	\$16.99
D1Q371I250	B371I Decommissioning Characterization	233	\$3,959.79	\$16.99
D1Q371H150	B371H Decommissioning Planning & Engineering	103	\$1,800.17	\$17.48
D1Q371I150	B371I Decommissioning Planning & Engineering	103	\$1,800.17	\$17.48
D1Q167T950	Tank TK167 Decommissioning (SET 14)	253	\$5,046.20	\$19.95
D1Q377X550	B377 Decommissioning Dismantlement	85	\$1,728.68	\$20.34
D1Q371H750	B371H Decommissioning Project Management	230	\$5,039.79	\$21.91
D1Q371I750	B371I Decommissioning Project Management	230	\$5,039.79	\$21.91
D1Q374A850	B374A Decommissioning Support Services	233	\$5,377.43	\$23.08
D1Q224T950	Tank TK224 Decommissioning (SET 14)	253	\$6,935.98	\$27.41
D1Q371J850	B371J Decommissioning Support Services	230	\$6,479.74	\$28.17
D1Q371K850	B371K Decommissioning Support Services	230	\$6,479.74	\$28.17
D1Q381X450	B381 Decommissioning Decontamination	85	\$2,522.44	\$29.68

5. The May 1999 Revision 2 of the Facility Disposition Cost Model states the schedule for facility decommissioning is based on Revision 7 of the Resource Leveled/Unconstrained Funding/Planning in the Year Prior to Decommissioning/Associated ER Actions Incorporated chart ("Eye-Chart"). There are discrepancies noted below between the 2006 CPB Schedule (P3 electronic copy) and the "Eye Chart." We recommend the contractor review the 2006 CPB Schedule and the "Eye-Chart" for accuracy and make any necessary revisions to either document.

- In the 2006 CPB Schedule, WBS 1.1.06.02.04.02, Bldg. 371 Decommissioning, 371/374 Cluster, indicates that decommissioning will start on October 1, 1999. The "Eye-Chart"

indicates a start of FY01 (October 1, 2000).

- The following chart indicates the discrepancies between 2006 CPB Schedule and the "Eye-Chart" completion dates in this cluster:

WBS	Description	"Eye-Chart" Completion Date	2006 CPB Completion Date	# of 2006 Activities Beyond
1.1.06.02.04.02	Bldg. 371 Decommissioning, 371/374 Cluster	FY04	FY05, FY06	35
1.1.06.02.04.03	Bldg. 373 Decommissioning, 371/374 Cluster	FY04	FY05, FY06	8
1.1.06.02.04.04	Bldg. 374 Decommissioning, 371/374 Cluster	FY04	FY05, FY06	8
1.1.06.02.04.05	Bldg. 374A Decommissioning, 371/374 Cluster	FY04	FY05, FY06	8
1.1.06.02.04.06	Bldg. 377 Decommissioning, 371/374 Cluster	FY04	FY05, FY06	8
1.1.06.02.04.07	Bldg. 378 Decommissioning, 371/374 Cluster	FY04	FY05, FY06	8
1.1.06.02.04.08	Bldg. 381 Decommissioning, 371/374 Cluster	FY04	FY05, FY06	16
1.1.06.02.06	REM/CONT 371/374 Cluster High Risk IHSS	FY05	FY06	7

- The 2006 CPB Schedule does not appear to include activities for WBS 1.1.06.02.06, REM/CONT 371/374 Cluster High Risk IHSS, characterization. These activities are indicated in the "Eye-Chart" for FY02.
- The "Eye-Chart" indicates that all decommissioning work for the 371A Cluster is to occur in FY06. The 2006 CPB Schedule forecasts that all work in the following WBS's is to be executed prior to FY06, with the exception of activity D1Q371H650, B371H Decommissioning Demolition.

WBS 1.1.06.03.04.01, Bldg. T371H Decommissioning, 371A Cluster FY04

WBS 1.1.06.03.04.02, Bldg. T371J Decommissioning, 371A Cluster FY04

WBS 1.1.06.03.04.03, Bldg. T371K Decommissioning, 371A Cluster FY04

WBS 1.1.06.03.04.04, Bldg. T376 Decommissioning, 371A Cluster FY04

WBS 1.1.06.03.04.05, Bldg. T376A Decommissioning, 371A Cluster FY04

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#### 4.4.4.2 PBD 017 – Building 707/750 Cluster Closure Project

##### *Approach*

The following comments, concerns and recommendations are the result of the team's review of those portions of the 2006 Closure Project Baseline (CPB) Schedule we felt were critical to site closure as scheduled in 2006. We did not review all of the 2006 CPB Schedule assumptions, scope and sequence; we reviewed a representative set of the Work Authorization Documents (WADs) within several critical Project Baseline Descriptions (PBDs). The comments below are organized by Work Authorization Documents (WADs) and Work Breakdown Structures (WBSs) reviewed in conjunction with the B707/750 Cluster Closure. The WADs reviewed in connection with the B707/750 Cluster Closure are:

- WAD 032 707/750 Cluster Project
- WAD 074 750 Pad Cluster Project
- WAD 075 750 Cluster Project

##### *Basis & Assumption Issues*

#### **WAD 032 – 707/750 Cluster Project**

<b>K-H Project Management Plan Assumption</b>	<b>Comment</b>
1. The regulatory agencies will adhere to document review schedules as described in RFCA.	It is unknown at this time if the appropriate regulatory agencies have been provided K-H's forecasts for approvals and if they have accepted the approval forecasts.
2. The regulatory agencies will approve the concept of an overall IA Characterization Plan that enables site specific planning information to be added as addenda.	It is not clear from the information who will approve this Plan or what impact it will have on the schedule if it is not approved.

**WAD 074 – 750 Pad Cluster Project**

<b>K-H Project Management Plan Assumption</b>	<b>Comment</b>
1. Catastrophic failure does not occur to facility systems and/or processes.	Catastrophic failure to systems or facilities could have a major impact to the schedule.
2. A new TRU waste storage facility will be available to relocate TRU/TRM waste from Tents 2 and 12 prior to the commencement of decommissioning activities in FY2004.	It does not appear the 2006 CPB Schedule reflects the necessary logic relationship for this interface.
3. MTCE work will only be required for Tents 2, 5 and 12 beginning 01/01/00.	It is unclear from the information what risk this assumption creates for the schedule.
4. No waste operation in Tents 3, 4, and 6 after 12/30/00.	It appears that the 2006 CPB Schedule reflects TRU/TRM staging and storage through FY03 but is not clear if it is in the identified areas.
5. Activities/projects in Tents 3, 4 and 6 will be required to provide funding for maintenance, technical support, compliance surveillance and facility operations management.	It is unclear from the information what risk this assumption creates for the schedule.
6. Deactivation will require only three months.	It appears that this scope is not represented in the 2006 CPB Schedule.
7. D&D does not encounter unscheduled events which will delay closure.	We recommend that the D&D activities reflect the Schedule Confidence Interval Delta Contingency as stated in the K-H Standard 10 – Scheduling.
8. IHSS 214 will require No Further Action.	Could represent scope being added to the current plan.
9. A/B requirements for storage of TRU/TRM waste is approved by 10/1/99.	It is not clear from the information who will approve this or what impact it will have on the schedule if it is not approved.

**Scope Issues**

The PBD 017 and WADs 032, 074 and 075 scope of work as stated in the PBD is required to achieve closure of the B707/750 cluster. The following scope does not appear to be included in the 2006 CPB Schedule:

1. WAD 032, WBS elements:

- 1.1.06.07.02 707 Cluster SNM Removal Operations
- 1.1.06.07.03.01 707 Cluster Deactivation Characterization
- 1.1.06.07.03.03 707 Cluster Deactivation Administrative Deactivation
- 1.1.06.07.03.04 707 Cluster Deactivation Authorization Basis Changes
- 1.1.06.07.03.06 707 Cluster Deactivation Final Physical Deactivation
- 1.1.06.13.03.01 778 Cluster Deactivation Characterization
- 1.1.06.13.03.03 778 Cluster Deactivation Administrative Deactivation
- 1.1.06.13.03.05 778 Cluster Deactivation Initial Physical Deactivation
- 1.1.06.13.03.06 778 Cluster Deactivation Final Physical Deactivation
- 1.1.06.13.04.02 778 Cluster Decommissioning Characterization

- 1.1.06.13.04.03 778 Cluster Decommissioning Site Preparation
- 1.1.06.13.04.04 778 Cluster Decommissioning Decontamination
- 1.1.06.13.04.05 778 Cluster Decommissioning Dismantlement
- 1.1.06.13.04.06 778 Cluster Decommissioning Demolition
- 1.1.06.13.04.07 778 Cluster Decommissioning Project & Operations Management
- 1.1.06.13.04.08 778 Cluster Decommissioning Support Services
- 1.1.06.13.06 Remediate/Contain 778 Cluster High Risk IHSSs

2. WAD 074, WBS elements:

- 1.1.06.09.02 750PAD Cluster SNM Removal Ops (*no future activities anticipated*)
- 1.1.06.09.03 750PAD Cluster Deactivation
- 1.1.06.09.04 750PAD Cluster Decommissioning
- 1.1.06.09.04.02 Facility P750 Decommissioning (*to be part of 1.1.06.09.04*)
- 1.1.06.09.04.05 Bldg T750G Decomm., 750PAD Cluster (*to be part of 1.1.06.09.04*)
- 1.1.06.09.04.07 Tent 3 Decommissioning, 750PAD Cluster (*to be part of 1.1.06.09.04*)
- 1.1.06.09.04.09 Tent 5 Decommissioning, 750PAD Cluster (*to be part of 1.1.06.09.04*)
- 1.1.06.09.04.10 Tent 6 Decommissioning, 750PAD Cluster (*to be part of 1.1.06.09.04*)
- 1.1.06.09.04.11 Tent 12 Decomm., 750PAD Cluster (*to be part of 1.1.06.09.04*)
- 1.1.06.09.06 Rem/Cont 750PAD Cluster High Risk IHSSs (*no future activities anticipated*)

3. WAD 075, WBS elements:

- 1.1.06.08.04.05 Bldg 707S Decommissioning, 750 Cluster
- 1.1.06.08.04.06 Bldg 709 Decommissioning, 750 Cluster
- 1.1.06.08.06 Remediate/Contain 750 Cluster High Risk IHSSs

4. K-H has stated that through FY98 (9/30/98) all completed activities were removed from the electronic copy of 2006 CPB Schedule. This may be the reason some of these activities do not appear in the 2006 CPB Schedule. If this work is not complete, we recommend that the scope be included in the 2006 CPB Schedule as outlined in the PBD.
5. Tanks 223, 145, 146, 147, 148, 248, 249, 250, and 251 appear in the 2006 CPB Schedule but do not appear to be listed in the PBD. We recommend the contractor review and coordinate the scope of work indicated in the PBD and in the 2006 CPB Schedule.

*Schedule Development Issues***WAD 032 – 707/750 Cluster Project****1.1.06.07.03.05 – 707 Cluster Deactivation Initial Physical Deactivation**

1. This WBS includes 54 activities (excluding milestones) and 46 have activity durations exceeding 60 work days which is not in accordance with the following K-H Standard 10 - Scheduling requirement:

*Activity Durations/Level of Detail. Current FY activities and FY+1 activities will generally be two working weeks to three months in duration, except for procurement, regulatory actions, or level-of-effort activities, which do not have intermediate points for performance measurement. Longer term durations for true level-of-effort activities are permissible. Activities scheduled from FY+2 through completion will have durations reflecting the level of scope development.*

This creates a concern for the schedule accuracy based on the level of detail as reflected by the activity durations. We recommend that K-H review the Standard 10 requirement and the 2006 CPB Schedule exceptions and make the necessary modifications to the 2006 CPB Schedule.

2. It appears that most of the activities in this WBS in the 2010 CPB Schedule were deleted and replaced with new activities in the 2006 CPB Schedule and that the WBS was completely reorganized to achieve schedule acceleration. The following areas were accelerated:
  - Activity D2RMILE313, Compl. B707 Cat I & II Cred. Rollup Holdup Remov., indicates an acceleration of 19 months from the 2010 to the 2006 CPB Schedule due to a change in the predecessor logic relationships. The new relationships appear to be logically constructed.
  - Activity D2RMILE305, B707 – Close MAA, indicates an acceleration of 18 months from the 2010 to the 2006 CPB Schedule due to a change in the predecessor logic relationships. The new relationships appear to be logically constructed.
  - Activity D2BMILE384, B707 Deactivation Complete, indicates an acceleration of 24 months from the 2010 to the 2006 CPB Schedule due to a change in the predecessor logic relationships. The predecessors for this Activity in the 2010 CPB were LOE activities. The predecessors in the 2006 CPB Schedule are detailed work activities. The new relationships appear to be logically constructed.

### 1.1.06.04.01 – Bldg 707 Decommissioning, 707 Cluster

1. Activity D2BMILE390, B707 DOP Approved, indicates an acceleration of 20 months from the 2010 to the 2006 CPB Schedule due to changes in the predecessor logic relationships. The predecessors for this Activity in the 2010 CPB are LOE and lead back to a manually constrained start date of October 1, 2001 for Activity D2BDA0002A, B707 Planning & Project Management. The predecessors for this Activity in the 2006 CPB are more detailed work activities and lead back to Activity A0FY199900, MILESTONE – START FY99. The redefined predecessor logic ties illustrate the acceleration of this Activity and appear to be logically constructed.
2. Activity D207DIS120, B707 Dismantlement – Set 3, C Module FY01, indicates start and finish dates in FY02. We recommend that the Activity Description be reviewed for accuracy and modified as necessary.
3. The 2006 CPB indicates 56 activities in this WBS of which only two were in the 2010 CPB Schedule. Essentially, it appears that this WBS was completely redeveloped to achieve schedule acceleration. Activity D2BMILE418, RFCA 707 Decom. Demolition Cmplt (EMSS35 FY05-4), indicates an acceleration of 20 months from the 2010 to the 2006 CPB Schedule. The variance appears to be caused by changes in the predecessor logic relationships. The new relationships appear to be logically constructed.
4. It appears that the 2006 CPB Schedule differs from the Rev. 7 (1/26/99) Baseline Resource Leveled/Unconstrained Funding/Planning In The Year Prior To Decommissioning/Associated ER Activities Incorporated chart (“Eye-chart”) with regard to the activities and Milestones shown below. The “Eye-chart” indicates that these activities will be complete by FY04. The following 2006 CPB Schedule activities are forecast in FY05. We recommend that the contractor confirm the dates shown in the 2006 CPB Schedule and “Eye-Chart.”

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Total Float
D2B707FDEM	B707 Decommissioning - Demolition	80	01OCT04	08FEB05	.37
D2B707FCHA	B707 Final Characterization Survey	19	04OCT04*	01NOV04	490
D2BMILE418	RFCA 707 Decom Demolition Cmplt (EMSS35 FY05-4)	0		08FEB05	430

#### 1.1.06.07.04.02 – Bldg 708 Decommissioning, 707 Cluster

1. It appears that the 2006 CPB Schedule differs from the Rev. 7 (1/26/99) Baseline Resource Leveled/Unconstrained Funding/Planning In The Year Prior To Decommissioning/Associated ER Activities Incorporated chart (“Eye-chart”) with regard to the activities and milestones shown below. The “Eye-chart” indicates that these activities will be complete by Fiscal Year 2004. The following 2006 CPB Schedule activities are forecast in FY05. We recommend that the contractor confirm the dates shown in the 2006 CPB Schedule and “Eye-Chart.”

Activity ID	Activity Description	Orig Dur	Early Start	Ear Fini
D2B708FDEM	B708 Decomm. Demolition	22	30SEP04	02NOV
D2B708COMP	B708 D&D Complete	0		02NOV

#### 1.1.06.07.04.03 – Bldg 711 Decommissioning, 707 Cluster

1. It appears that the 2006 CPB Schedule differs from the Rev. 7 (1/26/99) Baseline Resource Leveled/Unconstrained Funding/Planning In The Year Prior To Decommissioning/Associated ER Activities Incorporated chart (“Eye-chart”) with regard to the activities and milestones shown below. The “Eye-chart” indicates that these activities will be complete by FY04. The following 2006 CPB Schedule activities are forecast in FY05. We recommend that the contractor confirm the dates shown in the 2006 CPB Schedule and “Eye-Chart.”

Activity ID	Activity Description	Orig Dur	Early Start	Ear Fini
D2B711FDEM	B711 Decomm. Demolition	22	30SEP04	02NOV
D2B711COMP	B711 D&D Complete	0		02NOV

2. Activities D2B711DDEC and D2B711EDIS both have the same description, B711 Decomm. Decontamination, the same duration, the same start and finish dates, but different budgeted costs. We recommend that these activities be reviewed for accuracy and that any necessary modifications be made to the 2006 CPB Schedule.

**1.1.06.07.04.04 – Bldg 711A Decommissioning, 707 Cluster**

1. It appears that the 2006 CPB Schedule differs from the Rev. 7 (1/26/99) Baseline Resource Leveled/Unconstrained Funding/Planning In The Year Prior To Decommissioning/Associated ER Activities Incorporated chart (“Eye-chart”) with regard to the activities and milestones shown below. The “Eye-chart” indicates that these activities will be complete by FY04. The following 2006 CPB Schedule activities are forecast in FY05. We recommend that the contractor confirm the dates shown in the 2006 CPB Schedule and “Eye-Chart.”

Activity ID	Activity Description	Orig Dur	Early Start	Ear Fini
D2B11AFDEM	B711A Decomm. Demolition	22	30SEP04	02NOV04
D2B711ACOM	B711A D&D Complete	0		02NOV04

**1.1.06.07.04.05 – Bldg 718 Decommissioning, 707 Cluster**

1. It appears that the 2006 CPB Schedule differs from the Rev. 7 (1/26/99) Baseline Resource Leveled/Unconstrained Funding/Planning In The Year Prior To Decommissioning/Associated ER Activities Incorporated chart (“Eye-chart”) with regard to the activities and milestones shown below. The “Eye-chart” indicates that these activities will be complete by FY04. The following 2006 CPB Schedule activities are forecast in FY05. We recommend that the contractor confirm the dates shown in the 2006 CPB Schedule and “Eye-Chart.”

Activity ID	Activity Description	Orig Dur	Early Start	Ear Fini
D2B718FDEM	B718 Decomm. Demolition	22	30SEP04	02NOV04
D2B718COMP	B718 D&D Complete	0		02NOV04

**1.1.06.07.05 – 707 Cluster Closure**

1. It appears that the 2006 CPB Schedule differs from the Rev. 7 (1/26/99) Baseline Resource Leveled/Unconstrained Funding/Planning In The Year Prior To Decommissioning/Associated ER Activities Incorporated chart (“Eye-chart”) with regard to the activities and milestones shown below. The “Eye-chart” indicates that these activities will be complete by FY04. The following 2006 CPB Schedule activities are forecast in FY05. We recommend that the contractor confirm the dates shown in the 2006 CPB Schedule and “Eye-Chart.”

Activity ID	Activity Description	Orig Dur	Early Start	Ear Fini
<b>1.1.06.07.05 707 CLUSTER CLOSURE</b>				
D2BDELE554	707 Cluster Closure Complete	0		24JANC
D2ENDPBD17	Complete PBD 017 - B707/750 Cluster Closure Proj	0		24JANC

2. Activity D2BMILE434, B707 Cluster Complete IHSS/UBC Remediation, indicates an acceleration of 27 ½ months from the 2010 to the 2006 CPB Schedule due to changes in the predecessor logic relationships. The majority of the activities in this WBS are IHSS related and are new to the 2006 CPB Schedule. It appears that this WBS was completely redeveloped to achieve schedule acceleration. The new relationships appear to be logically constructed.

#### **1.1.06.13.03.02 – 778 Cluster Deactivation Planning and Project Management**

1. Activity D2B001303A, B778 Cluster Deactivation, indicates an acceleration of 3 ½ months from the 2010 to the 2006 CPB Schedule due primarily to the shortened activity duration from 12 months to three months. The start date was delayed by five months, but the shortened duration caused the acceleration. In addition, the budgeted cost for this Activity increased from \$490,531.69 to \$1,578,985.92. This increased the cost per day from \$1,923.65 to \$25,063.27. We recommend that the new duration and budgeted cost for this Activity be reviewed for accuracy and any necessary modifications be made to the 2006 CPB Schedule.

#### **WAD 074 – 750PAD Cluster Project**

##### **1.1.06.09.04.04 – Bldg T750F Decomm., 750PAD Cluster**

1. Activity H4KMER010, 750 Pad Closure, indicates a delay of 13 months from the 2010 to the 2006 CPB Schedule due the shortened activity duration from 10 months to two months and the delayed start date by 22 months. The predecessor logic in the 2006 CPB Schedule also differs from that in the 2010 CPB Schedule, however, the new logic relationships appear to be constructed logically.

##### **1.1.06.09.05 – 750PAD Cluster Closure**

1. Activity H4KMILE592, Complete 750 PAD Cluster Demo, has the above listed activity, H4KMER010, 750 Pad Closure, as its only predecessor in both the 2010 and the 2006 CPB Schedule and thus shares the same 13 month impact.



**WAD 075 – 750 Cluster Project****1.1.06.08 – Remove 750 Cluster**

1. It appears that the 2006 CPB Schedule differs from the Rev. 7 (1/26/99) Baseline Resource Leveled/Unconstrained Funding/Planning In The Year Prior To Decommissioning/Associated ER Activities Incorporated chart (“Eye-chart”) with regard to the activity shown below. The “Eye-chart” indicates that these activities will be complete by FY04. This 2006 CPB Schedule activity is forecast to occur in FY05. We recommend that the contractor confirm the dates shown in the 2006 CPB Schedule and “Eye-Chart.”

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Total Float
HSENDWAD75	WAD 75 - 750 Cluster Closure Complete	0		04JAN05	10

**Cost & Resource Loading Issues****WAD 032 – 707/750 Cluster Project****1.1.06.07.04.02, 1.1.06.07.04.03, 1.1.06.07.04.04**

1. The 2006 CPB Schedule activities for the below listed WBSs include similar activity descriptions with identical Original Durations, and Early Start and Finish Dates. However, the Budgeted Cost for each activity does not match its corresponding activity in the other WBSs. Since the Original Durations are identical, the Cost per Day for similar activities varies widely, as shown below. It is noted that the sizes of the three Type I buildings vary, however, assuming the Original Durations represent a continuous work effort, we recommend that the Original Durations and Budgeted Costs of the activities in each WBS be reviewed for accuracy and any necessary modifications be made to the 2006 CPB Schedule.

**1.1.06.07.04.02 – Bldg 708 Decommissioning, 707 Cluster**

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Budgeted Cost	Cost/Day
D2B708APEN	B708 Decomm. Planning & Engineering	104	1-Oct-03*	16-Mar-04	\$ 35,743	\$ 344
D2B708BCHR	B708 Decomm. Characterization	228	1-Oct-03	29-Sep-04	\$ 60,762	\$ 267
D2B708GPMG	B708 Decomm. Project & Ops. Mgmt	228	1-Oct-03	29-Sep-04	\$ 75,058	\$ 329
D2B708HSUS	B708 Decomm. Support Services	228	1-Oct-03	29-Sep-04	\$ 50,106	\$ 220
D2B708CSPR	B708 Decomm. Site Preparation	23	17-Mar-04	20-Apr-04	\$ 21,483	\$ 934
D207DIS240	B708 Dismantlement - Set 15, Building 708	85	21-Apr-04	2-Sep-04	\$112,821	\$ 1,327
D2B708DDEC	B708 Decomm. Decontamination	85	21-Apr-04	2-Sep-04	\$107,414	\$ 1,264
D2B708EDIS	B708 Decomm. Dismantlement	85	21-Apr-04	2-Sep-04	\$107,414	\$ 1,264
D2B708FDEM	B708 Decomm. Demolition	22	30-Sep-04	2-Nov-04	\$220,035	\$10,002

## 1.1.06.07.04.03 – Bldg 711 Decommissioning, 707 Cluster

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Budgeted Cost	Cost/Day
D2B711APEN	B711 Decomm. Planning & Engineering	104	1-Oct-03*	16-Mar-04	\$ 9,500	\$ 91
D2B711BCHR	B711 Decomm. Characterization	228	1-Oct-03	29-Sep-04	\$ 5,700	\$ 25
D2B711GPMG	B711 Decomm. Project & Ops. Mgmt	228	1-Oct-03	29-Sep-04	\$19,950	\$ 88
D2B711HSUS	B711 Decomm. Support Services	228	1-Oct-03	29-Sep-04	\$15,209	\$ 67
D2B711CSPR	B711 Decomm. Site Preparation	23	17-Mar-04	20-Apr-04	\$ 5,700	\$ 248
D207DIS250	B711 Dismantlement - Set 16, Building 711	85	21-Apr-04	2-Sep-04	\$30,291	\$ 357
D2B711DDEC	B711 Decomm. Decontamination	85	21-Apr-04	2-Sep-04	\$29,450	\$ 346
D2B711EDIS	B711 Decomm. Decontamination	85	21-Apr-04	2-Sep-04	\$28,500	\$ 335
D2B711FDEM	B711 Decomm. Demolition	22	30-Sep-04	2-Nov-04	\$47,975	\$2,181

## 1.1.06.07.04.04 – Bldg 711A Decommissioning, 707 Cluster

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Budgeted Cost	Cost/Day
D2B11AAPEN	B711A Decomm. Planning & Engineering	104	1-Oct-03*	16-Mar-04	\$ 9,795	\$ 94
D2B11ABCHR	B711A Decomm. Characterization	228	1-Oct-03	29-Sep-04	\$16,652	\$ 73
D2B11AGPMG	B711A Decomm. Project & Ops. Mgmt	228	1-Oct-03	29-Sep-04	\$20,569	\$ 90
D2B11AHSUS	B711A Decomm. Support Services	228	1-Oct-03	29-Sep-04	\$13,713	\$ 60
D2B11ACSPR	B711A Decomm. Site Preparation	23	17-Mar-04	20-Apr-04	\$ 5,877	\$ 256
D2B11ADDEC	B711A Decomm. Decontamination	85	21-Apr-04	2-Sep-04	\$ 3,918	\$ 46
D2B11AEDIS	B711A Decomm. Dismantlement	85	21-Apr-04	2-Sep-04	\$29,385	\$ 34
D207DIS260	B711A Dismantlement - Set 17, Bldg 711A	101	21-Apr-04	29-Sep-04	\$32,523	\$ 322
D2B11AFDEM	B711A Decomm. Demolition	22	30-Sep-04	2-Nov-04	\$52,415	\$2,382

## 1.1.06.07.06 – Rem/Cont 707 Cluster High Risk IHSSs

1. This WBS includes two activities with similar Activity Descriptions, identical Original Durations and different Budgeted Costs. This causes the Cost per Day to vary greatly between the two activities, as shown below. Assuming the Original Durations represent a continuous work effort, we recommend that the durations and budgeted costs of these activities be reviewed for accuracy and that necessary modifications be made in the 2006 CPB Schedule.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Budgeted Cost	Cost/Day
D2ER167250	Remedial Action - IHSS Group 700-1	80	8-Nov-04	16-Mar-05	\$140,182	\$1,752
D2ER674250	Remedial Action - IHSS Group 700-2	80	9-Feb-05	14-Jun-05	\$335,250	\$4,191

**WAD 074 – 750PAD Cluster Project****1.1.06.09.04.01 – 750 Tent Decommissioning**

1. This WBS includes nine activities with similar Activity Descriptions, identical Original Durations and Budgeted Costs. However, the Cost per Day of these activities is extremely low, as shown below. Assuming the Original Durations represent a continuous work effort, we recommend that both the durations and budgeted costs of these activities be reviewed for accuracy and any necessary modifications be made to the 2006 CPB Schedule.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Budgeted Cost	Cost/Day
H4TK117100	Tank TK117 Decommissioning	255	1-Oct-03	30-Sep-04	\$302	\$1
H4TK145100	Tank TK145 Decommissioning	255	1-Oct-03	30-Sep-04	\$302	\$1
H4TK146100	Tank TK146 Decommissioning	255	1-Oct-03	30-Sep-04	\$302	\$1
H4TK147100	Tank TK147 Decommissioning	255	1-Oct-03	30-Sep-04	\$302	\$1
H4TK148100	Tank TK148 Decommissioning	255	1-Oct-03	30-Sep-04	\$302	\$1
H4TK248100	Tank TK248 Decommissioning	255	1-Oct-03	30-Sep-04	\$302	\$1
H4TK249100	Tank TK249 Decommissioning	255	1-Oct-03	30-Sep-04	\$302	\$1
H4TK250100	Tank TK250 Decommissioning	255	1-Oct-03	30-Sep-04	\$302	\$1
H4TK251100	Tank TK251 Decommissioning	255	1-Oct-03	30-Sep-04	\$302	\$1

**WAD 075 – 750 Cluster Project****1.1.06.08.04 – 750 Cluster Decommissioning**

1. It is noted in this WBS that there are many activities with similar Activity Descriptions, identical Original Durations and different Budgeted Costs. This causes the Cost per Day to vary greatly between the activities, as shown below. Assuming the Original Durations represent a continuous work effort, we recommend that the durations of these activities be reviewed for accuracy and that necessary modifications be made to the 2006 CPB Schedule.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Budgeted Cost	Cost/Day
H5709TAPEN	B709 CT Decommissioning Planning & Eng	104	1-Oct-03	27-Feb-04	\$ 9,500	\$ 91
H57500APEN	B750 Decommissioning Planning & Eng	104	1-Oct-03	27-Feb-04	\$ 202,142	\$ 1,944
H5709TBCHR	B709 CT Decommissioning Characterization	233	1-Oct-03	30-Aug-04	\$ 5,700	\$ 24
H57500BCHR	B750 Decommissioning Characterization	234	1-Oct-03	31-Aug-04	\$ 343,631	\$ 1,469
H5709TGPMG	B709 CT Decommissioning Project Mgmt	253	1-Oct-03	28-Sep-04	\$ 19,950	\$ 79
H5709THSUS	B709 CT Decommissioning Support Services	253	1-Oct-03	28-Sep-04	\$ 15,209	\$ 60
H57500GPMG	B750 Decommissioning Project Management	253	1-Oct-03	28-Sep-04	\$ 424,478	\$ 1,678
H57500HSUS	B750 Decommissioning Support Services	253	1-Oct-03	28-Sep-04	\$ 342,631	\$ 1,354
H5709TCSPR	B709 CT Decommissioning Site Preparation	22	1-Mar-04	30-Mar-04	\$ 5,700	\$ 259
H57500CSPR	B750 Decommissioning Site Preparation	22	1-Mar-04	30-Mar-04	\$ 155,517	\$ 7,069
H5709TDDEC	B709 CT Decommissioning Decontamination	85	31-Mar-04	29-Jul-04	\$ 3,800	\$ 45
H5709TEDIS	B709 CT Decommissioning Dismantlement	85	31-Mar-04	29-Jul-04	\$ 66,975	\$ 788
H57500DDEC	B750 Decommissioning Decontamination	85	31-Mar-04	29-Jul-04	\$1,606,998	\$18,906
H57500EDIS	B750 Decommissioning Dismantlement	85	31-Mar-04	29-Jul-04	\$ 777,586	\$ 9,148
H5709TFDEM	B709 CT Decommissioning Demolition & Disp	23	30-Jul-04	31-Aug-04	\$ 13,300	\$ 578
H57500FDEM	B750 Decommissioning Demolition & Disp	23	30-Jul-04	31-Aug-04	\$1,422,276	\$61,838

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#### 4.4.4.3 PBD018 – Building 771/774 Cluster Closure Project

##### *Approach*

The following comments, concerns and recommendations are the result of the team's review of those portions of the 2006 Closure Project Baseline (CPB) Schedule we felt were critical to site closure as scheduled in 2006. We did not review all of the 2006 CPB Schedule assumptions, scope and sequence; we reviewed a representative set of the Work Authorization Documents (WADs) within several critical Project Baseline Descriptions (PBDs). The comments below are organized by Work Authorization Documents (WADs) and Work Breakdown Structures (WBSs) reviewed in conjunction with the B771/774 Cluster Closure. The WADs reviewed in connection with the B771/774 Cluster Closure are:

- WAD 034        771/774 Cluster Project
- WAD 076        771/774 Remediation Project
- WAD 091        B771/774 Bottle Box Operations

##### *Basis & Assumption Issues*

#### **WAD 034 – 771/774 Cluster Project**

<b>K-H Project Management Plan Assumption</b>	<b>Comment</b>
1. No new Price Anderson Rules	It is not clear from the information what the Price Anderson Rules or how they would affect the schedule.
2. Adequate Work Force clearances are granted by DOE as planned/projected.	Obtaining resources appears to be critical to the D&D work in the 2006 CPB Schedule.
3. RFETS does not have a seismic event that requires re-entry inspections as described in DDS-068-98.	It is unclear from the information if there is a contingency plan in the 2006 CPB Schedule for this or what effect a seismic event would have on the schedule.

#### **WAD 076 – 771/774 Remediation Project**

<b>K-H Project Management Plan Assumption</b>	<b>Comment</b>
1. The regulatory agencies will adhere to document review schedules as described in RFCA.	It is not known at this time if the appropriate regulatory agencies have been provided K-H's forecasts for approvals and if they have accepted the approval forecasts.
2. The regulatory agencies will approve the concept of an overall IA Characterization Plan that enables site specific planning information to be added as addenda.	It is not clear from the information who will approve this Plan or what impact it will have on the schedule if it is not approved.

### Scope Issues

The PBD 018 and WADs 034 and 076 scope of work as stated in the Project documentation is required to achieve closure of the B771/774 cluster. The following scope does not appear to be included in the 2006 CPB Schedule:

1. WBS element 1.1.06.10.05 771/774 Cluster Closure
2. Buildings 714, 714A, 714B, 715, 715A, 716, 717, 772, 772A, 773, 774A, 774B, 775, 770, 770B, 771B, T230, T771A, T771B, T771C, T771D, T771E, T771F, T771G, T771H, T771J, T771K, and T771L are listed in the PBD but do not appear to be represented in the schedule with individual activities for their removal.
3. Tanks 173, 174, 175, 176, 179, 180, 182, 183, 184, 185, 192, 193, 194, 195, 292, and 293 are listed in the PBD but do not appear to be represented in the schedule with individual activities for their removal.
4. It appears that most of the WBS elements for the work in each of the "sets" within this cluster do not include activities that match the scope of work indicated in the PBD. These WBS's are 1.1.06.10.04.01 through 1.1.06.10.04.81 and 1.1.06.10.04.95. The following excerpt from PBD 018 is an example of the PBD apparently including more individual scope items than are represented in the 2006 CPB Schedule:

***"1.1.06.10.04.37 B771-Set 37-Equipment Dismantlement in Rm 181A Boxes – Decommissioning"***

*The west end of the room contains 55 gal drums of High Level Mixed Waste. This material will need to be moved before an NDA assessment can be performed to get an accurate value of the SNM hold-up. This set includes Room 181A, Glovebox SR14, Tanks D-1400, D-1401, D-1402, D-1406, D-1407, D-1409, D-1410, D-1411, D-1414 and D-1415, an electrical panel, a scrubber refrigeration unit and associated valves and piping."*

The figure below shows the corresponding WBS activities for the description above. We recommend that the 2006 CPB Schedule be revised to accurately reflect the activities required to accomplish the scope of work listed in the PBD.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Total Float	Target 1 Early Finish	Variance 1 Early Finish	Budgeted Cost
<b>1.1.06.10.04.37 B771-SET 37-EQUIP DISMANTLE IN RM 181A</b>								
D4X7137	Set 37 - Room 181A Process Area	191	24MAR99*	30SEP99	643	27SEP99	-3	285,317.86

5. K-H has stated that through FY98 (9/30/98) all completed activities were removed from the electronic copy of 2006 CPB Schedule. This may be the reason some of these activities do not appear in the 2006 CPB Schedule. If this work is not complete, we recommend that the scope be included in the 2006 CPB Schedule as outlined in the PBD.

## Schedule Development Issues

### WAD 034 – 771/774 Cluster Project

#### General Comments/Questions

1. Activities shown below have an activity Original Duration but no Budgeted Cost. We recommend that the Original Duration and Budgeted Cost for these activities be verified for accuracy.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Budgeted Cost
D4R0304T05	Tech. Support - Tech. Support - B771 - FY04	100	01OCT03	09MAR04	0.00
D4KSNM1140	Vulnerability Analysis	143	14DEC98*	28JUL99	0.00
D4KF2B02	Execute FU-2B Plenum	20	15APR99	17MAY99	0.00
D4KF2B03	Characterize FU-2B Plenum	19	06MAY99	04JUN99	0.00

#### 1.1.06.10.01.02 – 771/774 Cluster Maintenance

1. The 2006 CPB Schedule shows the activities within this WBS as LOE for landlord functions for the B771/774 cluster. The 2006 CPB Schedule indicates an acceleration of 5 ½ months from the 2010 CPB Schedule. It appears that the decreased duration of Activity D4R079R03, B790 Landlord FY2003 – First Half, by 5 ½ months created the 5 ½ month schedule acceleration. The basis for the shortened duration can not be determined from the information provided. We recommend that the activity duration be reviewed for accuracy.
2. It appears that the LOE activities within this WBS do not contain interface logic with the Building decommission activities. For FY99 and FY00 there appears to be sufficient information available to show the appropriate interdependency relationship between the support LOE activities and the appropriate decommission activities. Appropriate interdependency relationships are needed in order to accurately determine the impact of decommissioning changes on the LOE activities, i.e. if decommissioning gets delayed there could be a potential impact to the LOE durations and cost. We recommend that K-H review the scope and interfaces of this scope and make the necessary revisions to the 2006 CPB Schedule to show the activity interdependencies.

#### 1.1.06.10.01.03.05 – OPNS Tech Support – Technical Support

1. The 2006 CPB Schedule shows the activities within this WBS as LOE operations functions for the B771/774 cluster. The 2006 CPB Schedule indicates an acceleration of 6 months from the 2010 CPB Schedule. The duration for Activity D4R0304T05, Tech. Support – Tech. Support – B771 – FY04, appears to have been shortened thus creating the 6-month acceleration. The basis for the shortened duration can not be determined from the information provided. We recommend that the activity duration be reviewed for accuracy. This activity also shows a 5-month Original Duration and no Budgeted Cost. We recommend that the Budgeted Cost be reviewed for accuracy.

2. It appears that the LOE activities within this WBS do not contain interface logic with the Building decommission activities. For FY99 and FY00 there appears to be sufficient information available to show the appropriate interdependency relationship between the support LOE activities and the appropriate decommission activities. Appropriate interdependency relationships are needed in order to accurately determine the impact of decommissioning changes on the LOE activities, i.e. if decommissioning gets delayed there could be a potential impact to the LOE durations and cost. We recommend that K-H review the scope and interfaces of this scope and make the necessary revisions to the 2006 CPB Schedule to show the activity interdependencies.

#### 1.1.06.10.01.05.01 – AB Development and Implementation

1. The activities below have basically the same Activity Description. We recommend that the scope of the activities and Activity Descriptions be clarified.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
D4VBFOD	B771/4 Implementation of Rev 3 BFO	73	19APR99	30JUL99
D4VCPM1806	Implement B771/774 BFO Rev 3	0		31AUG99*

2. The activities below appear to have multiple responsibilities within each activity. In accordance with the Standard 10 Scheduling, we recommend that the 2006 CPB Schedule indicate individual activities for each responsibility.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
D4VBFOA	B771 Approval & Implementation of Rev 2 BFO	28	21DEC98*	29JAN99
D4VBFOC	B771/4 Develop and Approv Rev 3 BFO	83	21DEC98	16APR99
D4VBFOB	B774 Approval & Implementation of Rev 2 BFO	103	21DEC98	14MAY99



### 1.1.06.10.02.08 – B771 SNM Removal

The 2006 CPB Schedule indicates the following variances from the 2010 CPB Schedule.

1. The 2006 CPB Schedule indicates a slip of approximately one month for Milestone activity D4KMILE308, B771 Reduce Security Access from “Q” to “L” due to a change in the predecessor logic from the 2010 to the 2006 CPB Schedule. This activity also has a constrained finish date and does not have a driving logic relationship to either of its two predecessor activities in the 2006 CPB Schedule nor did it have a driving logic relationship to its predecessor in the 2010 CPB Schedule. The basis for the constraint can not be determined with the information available. We recommend that the constraints be explained and replaced with appropriate interface logic to reflect the sequencing plan.
2. The B771 SNM Holdup Removal Milestone and its driving predecessor activities listed below indicate an acceleration of 1 ½ months from the 2010 CPB Schedule due to changes in the driving logic relationships. Each has a driving logic relationship to the other, however, activity D4KSNM1430, Revise Procedure/Plans/Documentation - FY00, had its driving logic relationship from the 2010 CPB Schedule removed in the 2006 CPB Schedule and replaced it with a constrained start date. The basis for the constraint can not be determined with the information available. We recommend that the constraints be explained and replaced with appropriate interface logic to reflect the sequencing plan.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Total Float	Target 1 Early Finish	Variance 1 Early Finish
D4KSNM1430	Revise Procedure/Plans/Documentation - FY00	18	04OCT99*	28OCT99	210	27DEC99	34
D4KPRJPM00	Project Management - FY00 SNM Removal	17	05OCT99*	28OCT99	210	27DEC99	34
D4KSNM1340	Project Complete - B771 SNM Holdup Remvl.	0		28OCT99	210	27DEC99	34

### 1.1.06.10.03.96 – B774 Sludge Tank Deactivation

- The activities in this WBS appear to be added to the 2006 CPB Schedule. Each of the three activities in this WBS, D4ASR100 - Removal of Sludge Tanks 201, 202, 203, & 204, D4ASR120 - Start Operations – Milestone for TSIS (WAD 07), and D4ASR110 - Removal of Sludge Tanks T-40 (old) & T-40 (new), have constrained start dates. There are gaps between predecessor activity finish dates and the constrained start dates. Below is an excerpt from the 2006 CPB Schedule that shows the predecessor activities for this WBS. The basis for the constraints can not be determined with the information available. We recommend that the constraints be explained and replaced with appropriate interface logic to reflect the sequencing plan if necessary.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Total Float
<b>000 WAD.000 - RFETS Site Level Activities</b>					
<b>1.1 ACHIEVE INTERMEDIATE SITE CONDITION</b>					
A0FY199900	MILESTONE - START FY99	0	01OCT98*		0
<b>034 WAD.034 - 771/774 Cluster Project</b>					
<b>1.1.06.10.01.05.01 AB DEVELOPMENT &amp; IMPLEMENTATION</b>					
D4VBFOA	B771 Approval & Implementation of Rev 2 BFO	28	21DEC98*	29JAN99	0
D4VBFOC	B771/4 Develop and Approv Rev 3 BFO	83	21DEC98	16APR99	22
D4VBFOB	B774 Approval & Implementation of Rev 2 BFO	103	21DEC98	14MAY99	0
D4VBFOD	B771/4 Implementation of Rev 3 BFO	73	19APR99	30JUL99	22
D4VCPM1803	B774 Implementation of Rev 2 BFO by 5/15/99	0		14MAY99*	0
D4VCPM1806	Implement B771/774 BFO Rev 3	0		31AUG99*	0
<b>1.1.06.10.03.96 B774 SLUDGE TANK DEACTIVATION</b>					
D4ASR100	Removal of Sludge Tanks 201,202,203, & 204	261	11APR01*	03JUN02	15
D4ASR120	Start Operations --Milestone for TSIS ( WAD 07 )	0	01OCT01*		28
D4ASR110	Removal of Sludge Tanks T-40 (old) & T-40 (new)	93	11MAR02*	05AUG02	26

### 1.1.06.10.04.01 thru 1.1.06.10.04.81 and 1.1.06.10.04.95

- It is also noted for the above referenced WBSs that a majority of the activities have an Original Duration greater than 60 days. K-H Scheduling Standard 10 indicates that activities in the current fiscal year and the next fiscal year should not have duration longer than 60 days, unless the activity is a “level of effort” activity such as landlord operations. Dismantlement, decommissioning, deactivation, etc. are not level of effort activities. This creates a concern for the schedule accuracy based on the level of detail as reflected by the activity durations. We recommend that the contractor provide the necessary level of detail for the WBSs listed above to comply with the K-H standard. See “Scope Issues” for additional comments on these WBSs.

#### **1.1.06.10.04.AA – Decommissioning Project Management**

1. It is noted that 2006 CPB Schedule for this WBS indicates an overall acceleration of 38 months from the 2010 CPB Schedule due to a change in logic and in the definition of "Cluster Closure." The predecessors and driving logic relationship for Activity D4X71PB08, Cluster Closure & Project Management Closure, changed. In the 2010 CPB, this Activity was the successor to the IHSS Remediation activities. It is now succeeded only by Activity H6ENDPBD18, Complete PBD 18, B771/774 Cluster Closure Project. K-H stated that, "Cluster Closure" (as indicated in Activity D4X71PB08 above) is achieved prior to any of the Environmental Restoration (ER) work. The 2010 CPB appears to include the ER work in the cluster closure. We recommend that further clarification of the end-state of cluster closure and whether or not ER is included in the cluster.

#### **1.1.06.15.04.82 – Set 82-B790 Decommissioning**

1. Note that the 2006 CPB Schedule for this WBS indicate an overall acceleration of 28 months from the 2010 Schedule due to a change in the predecessor logic relationships and to shortening of the durations of each activity. In the 2010 CPB, this WBS was manually constrained by its predecessors to start in April, 2006. These predecessors were LOE activities and did not tie this work to any other detailed work activities. In the 2006 CPB, this predecessor relationship was replaced by work related activities in WBS 1.1.06.10.04.81, B771-Set 81-771/774 Cluster Out-Bldgs-Decomm. It appears that the added detailed logic and planning reflected in the 2006 CPB Schedule predecessors for this WBS caused the acceleration.

#### **WAD 076 – 771/774 Remediation Project**

##### **1.1.06.10.06 – Rem/Cont 771/774 Cluster High Risk IHSS**

1. It is noted 2006 CPB Schedule for this WBS indicates an overall acceleration of 29 months from the 2006 CPB Schedule due to changes in driving logic relationships related to Activity H66MILE433, B771/774 Cluster Complete IHSS/UBC Remediation. In the 2010 CPB, the predecessor activities are LOE activities and lead back to Activity A0FY199900, Milestone - Start FY99. In the 2006 CPB Schedule, the LOE predecessor activities are replaced with detailed work activities that link the IHSS work to actual D&D activities in the 771/774 cluster. The acceleration of this WBS appears to be supported by the new logic ties.
2. It is also noted that this WBS is substantially more developed in the 2006 CPB than in the 2010 CPB as 41 of its 52 activities are new to the 2006 CPB Schedule. Another nine activities were either deleted from the 2010 CPB or renamed in the 2006 CPB.

**WAD 091 – B771/774 Bottle Box Operations****1.1.04.09.03.03.01 – Bottle Box/Cementation Operation**

1. It is noted that Activity K1F7BB110, Batch & Transp. Bottles to B774 - FY99, and Activity K1F7BB510, FY99 Bottle Box Treat Bottles, indicate durations of 103 and 126 days, respectively. K-H Standard 10 Scheduling indicates that activity durations for the current and next fiscal year should not exceed 60 days, unless they are “level of effort” in nature, in order to meet the desired level of detail in the schedule. This creates a concern for the schedule accuracy based on the level of detail as reflected by the activity durations. The activities listed above are not LOE activities and we recommend that these activities be revised to meet the K-H Standard.

**Cost & Resource Loading Issues****WAD 034 – 771/774 Remediation Project****1.1.06.10.01.05.01 – Authorization Basis Development & Implementation**

1. This WBS contains three activities whose budgeted cost changed significantly from the 2010 to the 2006 CPB Schedule. We recommend that further clarification of these activities be obtained. See Below.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float	2006 CPB Budgeted Cost	2010 CPB Budgeted Cost
D4R0501A00	B771 New/Revised Author. Basis FY2001	227	2-Oct-00	27-Sep-01	167	\$588,000	\$39,879
D4R0502A00	B771 New/Revised Author. Basis FY2002	228	1-Oct-01	30-Sep-02	167	\$588,000	Did not exist in 2010 schedule
D4R0503A00	B771 New/Revised Author. Basis FY2003	228	1-Oct-02	30-Sep-03	167	\$588,000	Did not exist in 2010 schedule

**1.1.06.10.02.08 – B771 SNM Removal**

1. This WBS includes three activities that have duration but no cost. We recommend that these activities be verified for accuracy or necessary modifications to the 2006 CPB Schedule be made.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float	Budgeted Cost
D4KSNM1140	Vulnerability Analysis	143	14-DEC-98*	28-Jul-99	41	\$0
D4KF2B03	Characterize FU-2B Plenum	19	6-May-99	4-Jun-99	16	\$0
D4KF2B02	Execute FU-2B Plenum	20	15-Apr-99	17-May-99	15	\$0

### 1.1.06.10.03.98 – Set 98 – Piping Removal

1. This WBS includes 37 activities described as “Closure Documents for System.” Twenty-six of these activities have Budgeted Cost of less than \$1,000. Eleven of these activities, however, have Budgeted Costs in excess of \$350,000. All 37 activities have similar Original Durations. Assuming the Original Duration represents a continuous work effort, we recommend that the scope, Original Duration and Budget Cost of these activities be verified and that the necessary schedule modification be incorporated into the 2006 CPB Schedule. See below for a comparison of a sample group of these activities.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float	Budgeted Cost	Cost/Day
D4FNEW1070	Closure Documentation System 21	10	5-Aug-99	19-Aug-99	537	\$ 766	\$ 77
D4FNEW1480	Closure Documentation System 18	10	13-Sep-99	27-Sep-99	3	\$1,397,613	\$139,761
D4FCASA520	Closure Documents for Sys 12	10	13-Sep-99	27-Sep-99	514	\$ 350,422	\$ 35,042
D4FNEW1400	Closure Documentation System 4	8	21-Sep-99	30-Sep-99	511	\$ 613	\$ 77
D4FCASA450	Closure Documents for Sys 33	10	29-Nov-99	13-Dec-99	467	\$ 350,575	\$ 35,057

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#### 4.4.4.4 PBD 019 - Building 776/777 Cluster Closure Project

##### *Approach*

The following comments, concerns and recommendations are the result of the team's review of those portions of the 2006 Closure Project Baseline (CPB) Schedule we felt were critical to site closure as scheduled in 2006. We did not review all of the 2006 CPB Schedule assumptions, scope and sequence; we reviewed a representative set of the Work Authorization Documents (WADs) within several critical Project Baseline Descriptions (PBDs). The comments below are organized by Work Authorization Documents (WADs) and Work Breakdown Structures (WBSs). The WADs reviewed in connection with the B776/777 Cluster Closure are:

- WAD 035 776/777 Cluster Project

##### *Basis & Assumption Issues*

##### WAD 035 – 776/777 Cluster Project

<b>K-H Project Management Plan Assumption</b>	<b>Comment</b>
1. The facility will maintain a 90% availability for Nuclear Operations and will maintain a production efficiency of 85%.	The basis for this can not be verified with the available information. It is also unclear how this is incorporated into the 2006 CPB Schedule activity durations
2. No significant, unplanned DNFSB recommendations will be received.	It appears unreasonable to plan for "No significant" DNFSB.
3. The regulatory agencies will adhere to document review schedules as described in RFCA.	It is not known at this time if the appropriate regulatory agencies have been provided K-H's forecasts for approvals and if they have accepted the approval forecasts.
4. The Regulatory agencies will approve the concept of an overall IA Characterization Plan that enables site specific planning information to be added as an addenda.	It is not clear from the information who will approve this Plan or what impact it will have on the schedule if it is not approved.

## Scope Issues

### 1.1.06.12.03 – 776/777 Cluster Deactivation

It appears that the 2006 CPB Schedule does not include activities for the Deactivation sub-tasks including Characterization, and some Final Physical Deactivation activities as defined in PBD 19. We recommend that K-H identify where time is allotted for these activities or make the necessary changes in the 2006 CPB Schedule. Below is a quote from this WBS description in the PBD 19 documentation.

*This element includes the sub-tasks of: Characterization, Planning & Project Management, Administrative Deactivation, Authorization Basis Changes, Initial Physical Deactivation, and some Final Physical Deactivation activities. Examples of specific activities within deactivation include: removal of hazardous and non hazardous materials, emptying storage areas to reduce fire loading, RCRA closures, and draining solutions from tanks and equipment. A physical inventory shall be completed and an economic disposition determination shall be made for unneeded property. The end-state of this element will be achieved when the facility is determined to be in a safe, shut-down status with minimal mortgage costs while awaiting decontamination, dismantlement, and demolition activities.*

## Schedule Development Issues

1. We note that there are over 50 activities (several examples are shown below) within WAD 019 which do not appear to meet K-H's Standard 10 Scheduling requirement. This creates a concern for the schedule accuracy based on the level of detail as reflected by the activity durations:
  - A. *Activity Durations/Level of Detail. Current FY activities and FY+1 activities will generally be two working weeks to three months in duration, except for procurement, regulatory actions, or level-of-effort activities, which do not have intermediate points for performance measurement. Longer term durations for true level-of-effort activities are permissible. Activities scheduled from FY+2 through completion will have durations reflecting the level of scope development.*



Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
D5F0199M02	Glove Inspection/Changes B776/7 FY-99 20% of TTL	94	16-Nov-98	31-Mar-99	1
D5F0299M05	Pressure Safety JCO (Major IWCP)	63	1-Oct-98	31-Dec-98	1
D5F0599N05	A/B Imp - Project Management/Administrative Spt	228	1-Oct-98	30-Sep-99	0
D5F0599N92	A/B Imp Design Features (TBD1)	110	1-Oct-98	26-Mar-99	0
D5F0599NA5	A/B Imp Seal Cable Hole	113	1-Oct-98	31-Mar-99	62
D5F0599NA6	A/B Imp Fire Retardant Coating	113	1-Oct-98	31-Mar-99	62
D5HD299MD1	Review and Incorp RFFO Comments on DOP	83	1-Oct-98	29-Jan-99	0
D5HD500D10	FY-00 Drain Ancillary Piping Systems	192	3-Jan-00	29-Sep-00	1
D5HD500G00	FY-00 B776/777 Glovebox Deactivation	127	1-Oct-99	31-Mar-00	0
D5HD500R10	FY-00 B776/777 Room Deact and Equipment Removal	192	3-Jan-00	29-Sep-00	1
D5HD500R15	FY-00 Rem Classified Telecom Sys/Docs from Rooms	127	3-Apr-00	29-Sep-00	1
D5HD500T05	FY-00 Drain SRV Tanks (SR3, 4 & 5)	127	3-Apr-00	29-Sep-00	1
D5HD500T10	Drn Tks T360,T370,T344 & T345 to RCRA Stable	192	3-Jan-00	29-Sep-00	1
D5HD500T15	FY-00 Drain FBI Pilot Tanks to RCRA Stable	192	3-Jan-00	29-Sep-00	1
D5HD599A01	FY-99 Disposition B776/777 Actuators	82	3-Dec-98	12-Apr-99	108
D5HD599G05	FY-99 Remove Oils/Solutions from GBs	126	1-Oct-98	31-Mar-99	0
D5HD599G16	FY-00 Remove Sources from Gloveboxes	191	1-Oct-99	30-Jun-00	0
D5HD599R10	FY-99 Remove Classified from Rooms	191	4-Jan-99	30-Sep-99	0
D5HD599R15	FY-99 Rem Microwave Samples from B701	191	4-Jan-99	30-Sep-99	0
D5HD599T20	FY-99 Drain Low Level Oils Tks B776/777	191	4-Jan-99	30-Sep-99	0
D5J2300040	B776/777 Set 23 Dismantlement Tasks	125	16-Dec-99	30-Jun-00	0
D5J2400040	B776/777 Set 24 Dismantlement Tasks	153	1-Feb-00	28-Sep-00	0
D5P0102010	B776/777 MAA Closure Execution Activities	64	3-Apr-00	30-Jun-00	0
D5P9902010	FY-99 B776/777 SNM Verification Walkdowns	64	1-Jul-99	30-Sep-99	0
D5P9902020	FY-99 B776/777 Remove Holdup Area 1	62	1-Oct-98	30-Dec-98	192
D5P9902120	FY-99 B776/777 Remove Holdup Area 11	61	27-May-99	23-Aug-99	27
D5P9902140	FY-99 B776/777 Remove Holdup Area 13	61	7-Jul-99	30-Sep-99	0
D5P9902150	FY-99 B776/777 Holdup Mtl Xfer to B707	191	4-Jan-99	30-Sep-99	1
D5P9902160	FY-99 B707 Thermal Stabilization of B776 Holdup	171	1-Feb-99	30-Sep-99	1
D5P99SCAN0	B776/777 Holdup Scans/Drum Movement	110	9-Apr-99	30-Sep-99	0

We recommend that K-H review the Standard 10 requirement and the 2006 CPB Schedule exceptions as well as make the necessary modifications.

- It appears that the WBS 1.1.06.12.01.01, 1.1.06.12.01.02, 1.1.06.12.01.03, and 1.1.06.12.01.04 contain LOE activities for surveillance, maintenance, tech support and operations management, many of which do not contain interface logic with the Building decommission activities. For FY99 and FY00 there appears to be sufficient information available to show the appropriate interdependency relationship between the support LOE activities and the appropriate decommission activities. Appropriate interdependency relationships are needed in order to accurately determine the impact of decommissioning

changes on the LOE activities, i.e. if decommissioning gets delayed there could be a potential impact to the LOE durations and cost. We recommend that K-H review the scope and interfaces of this scope and make the necessary schedule revisions to show the activity interdependencies.

### **WAD 035 – 776/777 Cluster Project**

#### **1.1.06.12.02 – 776/777 Cluster SNM Removal Operations**

1. It appears that the following activities representing SNM removal have the start Milestone WPD 35 as their predecessor and all but one have start constraints. The lack of relationships between areas indicates that the work in the areas is independent of each other from a sequencing and resource perspective. The basis for these constraints is unknown. We recommend that the constraints be explained and replaced with appropriate interface logic to reflect the sequencing plan.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
D5P9902020	FY-99 B776/777 Remove Holdup Area 1	62	1-Oct-98	30-Dec-98	192
D5P9902030	FY-99 B776/777 Remove Holdup Area 2	60	26-Oct-98*	21-Jan-99	177
D5P9902040	FY-99 B776/777 Remove Holdup Area 3	60	18-Nov-98*	15-Feb-99	160
D5P9902050	FY-99 B776/777 Remove Holdup Area 4	60	15-Dec-98*	10-Mar-99	143
D5P9902060	FY-99 B776/777 Remove Holdup Area 5	59	11-Jan-99*	1-Apr-99	127
D5P9902070	FY-99 B776/777 Remove Holdup Area 6	60	2-Feb-99*	26-Apr-99	110
D5P9902080	FY-99 B776/777 Remove Holdup Area 7	60	25-Feb-99*	19-May-99	93
D5P9902090	FY-99 B776/777 Remove Holdup Area 8	60	22-Mar-99*	14-Jun-99	76
D5P9902100	FY-99 B776/777 Remove Holdup Area 9	60	13-Apr-99*	07-Jul-99	60
D5P9902110	FY-99 B776/777 Remove Holdup Area 10	60	6-May-99*	30-Jul-99	43
D5P9902120	FY-99 B776/777 Remove Holdup Area 11	61	27-May-99*	23-Aug-99	27
D5P9902130	FY-99 B776/777 Remove Holdup Area 12	60	21-Jun-99*	14-Sep-99	12
D5P9902140	FY-99 B776/777 Remove Holdup Area 13	61	7-Jul-99*	30-Sep-99	0

\* asterisk indicates manually constrained date

2. We note that the activities above have relatively the same activity Original Duration and the same budgeted cost of \$39,766.88. We recommend that K-H review the Original Duration and Budget Costs to ensure that they accurately reflect the unique Area characteristics as noted during the detailed walkdowns referenced in the PBD.
3. The following activities are concurrent with the SNM Holdup Removal forecast for October 1, 1998 through September 30, 1999. It appears that these activities may logically continue beyond September 30, 1999 for the processing of the material that is removed near September 30, 1999. We recommend that K-H verify that the logic for these activities accurately reflects their execution plan as well as safe and reasonable practices.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float
D5P9902005	FY-99 B776/777 SNM Holdup Removal Project Mgmt	254	1-Oct-98	30-Sep-99	1
D5P9902160	FY-99 B707 Thermal Stabilization of B776 Holdup	171	1-Feb-99	30-Sep-99	1
D5P9902190	FY-99 Holdup Removal Planning for FY-00 5 Areas	129	31-Mar-99*	30-Sep-99	0
D5P99SCAN0	B776/777 Holdup Scans/Drum Movement	110	9-Apr-99*	30-Sep-99	0
D5P9902010	FY-99 B776/777 SNM Verification Walkdowns	64	1-Jul-99*	30-Sep-99	0

\* asterisk indicates manually constrained date

4. The B776/777 Completion of Removal of all SNM Requiring Stabilization (Activity D5PMIL323) is forecast to complete May 22, 2003 while the MAA Closure forecast to complete nearly three years earlier on June 30, 2000. The scope of this remaining work is unclear since there appears to be no activities for Final Physical Deactivation with the exception of the following activities included in 1.1.06.12.03.05 Initial Physical Deactivation:

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float	Budgeted Cost
D5HD500R35	Remove Remaining Legacy Waste Drums	254	1-Oct-99	29-Sep-00	1	\$ 289,754
D5HD599R25	FY-00 Rem Loose Haz Materials from Rooms	254	1-Oct-99	29-Sep-00	1	\$ 9,970
D5HD599T25	FY-00 Drain/Remove Trichlorethane Line	254	1-Oct-99	29-Sep-00	1	\$ 60,291
D5HD500D10	FY-00 Drain Ancillary Piping Systems	192	3-Jan-00	29-Sep-00	1	\$ 279,370
D5HD500R10	FY-00 B776/777 Room Deact and Equipment Removal	192	3-Jan-00	29-Sep-00	1	\$ 184,097
D5HD500T10	Drn Tks T360,T370,T344 & T345 to RCRA Stable	192	3-Jan-00*	29-Sep-00	1	\$ 52,120
D5HD500T15	FY-00 Drain FBI Pilot Tanks to RCRA Stable	192	3-Jan-00	29-Sep-00	1	\$ 52,189
D5HD599R40	Clean out Advanced Size Reduction Area	174	27-Jan-00	29-Sep-00	0	\$ 145,775
D5HD500MS2	FY-00 Clean out GBs in Sets 1,14,20,29,41 and 69	0		31-Mar-00	0	\$ 0
D5HD500R15	FY-00 Rem Classified Telecom Sys/Docs from Rooms	127	3-Apr-00*	29-Sep-00	1	\$ 56,292
D5HD500T05	FY-00 Drain SRV Tanks (SR3, 4 & 5)	127	3-Apr-00	29-Sep-00	1	\$ 104,241
D5HD500MS8	FY00 Comp Rem Radioact Sources from GB&Rms	0		30-Jun-00	0	\$ 0
D5HMLE320	FY00-T5 Drain Mixed Residue Tanks Complete	0		28-Sep-00	1	\$ 0
D5HD500M01	FY-00 Complete SR3,4&5 Tank Draining	0		29-Sep-00	1	\$ 0
D5HD500MS1	Comp Draining of Rem Tanks/Ancillary Eq to RCRA	0		29-Sep-00	1	\$ 0
D5HD599MS5	FY-00 Comp Rem of Loose Haz Mtls from Rms	0		29-Sep-00	1	\$ 0
D5HMLE499	B776/777 Complete Legacy Waste Removal	0		29-Sep-00	1	\$ 0
D5HD500T20	FY-01 Drain to RCRA stable Equip in Rm 146	253	2-Oct-00	28-Sep-01	1	\$ 245,203
D5HD501R05	FY-01 B776/777 Room Deact and Equipment Removal	253	2-Oct-00*	28-Sep-01	1	\$ 742,749
D5FMILE392	B776/777 Deactivation Complete	0		28-Sep-01	1	\$ 0
D5HD500MS3	FY-01 Comp Rem of Loose Haz Mtls, Rms	0		28-Sep-01	1	\$ 0
D5HMLE465	Complete B776/777 Excess Property Removal	0		30-Sep-03	1	\$ 0
<b>TOTAL</b>						<b>\$2,222,051</b>

\* asterisk indicates manually constrained date

We recommend that K-H verify that the assumptions to close the MAA with the amount of outstanding deactivation work as anticipated between June 30, 2000 and May 22, 2003 are in accordance with DOE's assumptions and accurately reflect that scope in the 2006 CPB Schedule.

- Of the 84 Start Set Decommissioning activities in the 2006 CPB Schedule, 70 have the same predecessor (Complete Set 17 Decommissioning), 11 have a predecessor of Initiate B776/777 Decommissioning and the last three differ completely. Additionally, of the 84 Start Set Decommissioning activities, 69 have start constraints. The basis for these constraints can not be determined with the available information. We recommend that the constraints be explained and replaced with appropriate logic to reflect the sequencing plan.

6. The sequencing of sets as reflected in the 2006 CPB Schedule was compared to the Building 776/777 - 2006 Set Prioritization received from the K-H Integration & Controls staff. It appears that the 2006 CPB Schedule forecasts are more compressed than the forecasts shown in the Set Prioritization Exhibit (attached at end of this section). For example many of the Set Prioritization sets forecast for FY02 are forecast for FY01 by the 2006 CPB Schedule. We recommend that K-H confirm which sequencing is current and make the necessary 2006 CPB Schedule modifications.
7. There are several activities with the description Project Specific Long Lead Procurement and Dismantlement Tasks within the Decommission set WBS that often have start constraints and therefore create non-work periods within the set sequencing. Figures A and B show two examples. The basis for these constraints can not be determined with the available information. We recommend that the constraints be explained and removed if necessary.

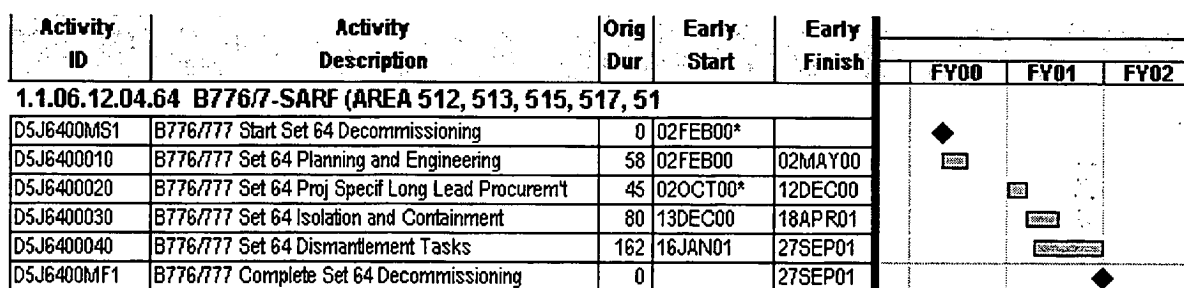


Figure A

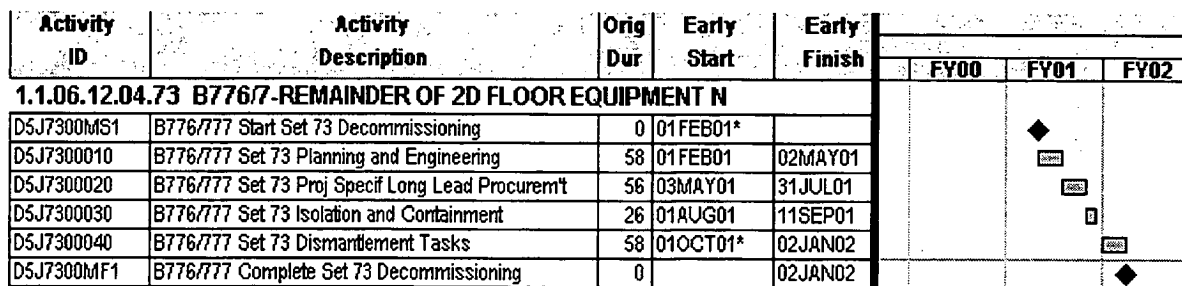


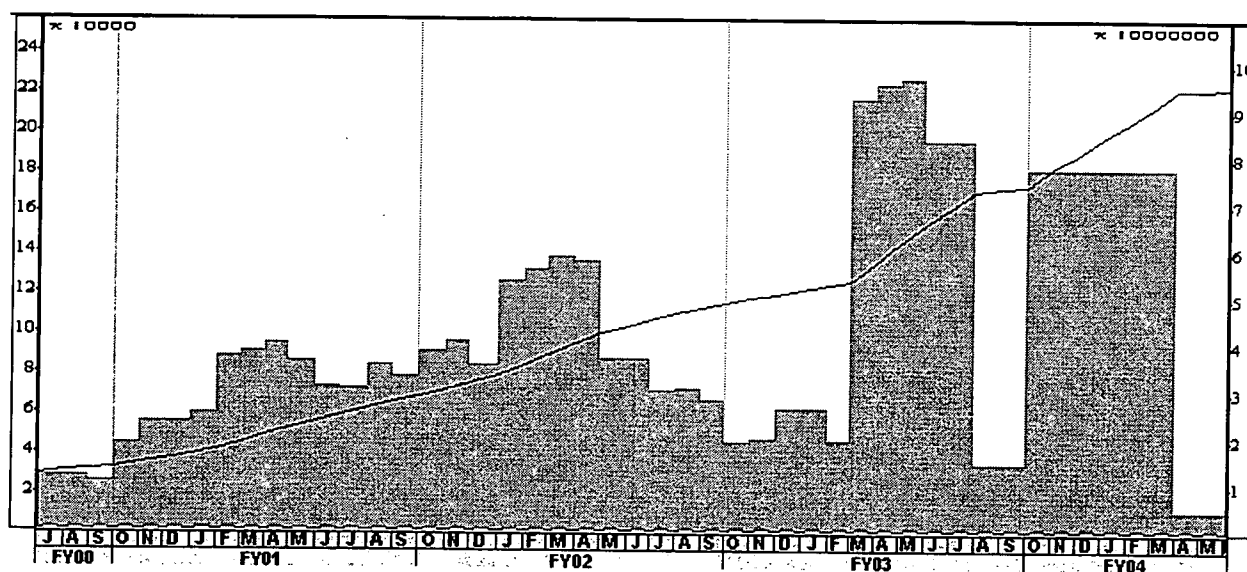
Figure B

### Cost & Resource Loading Issues

1. In reviewing the sequencing of the decommissioning activities as well as the associated resource loading, it would appear that the scheduling strategy does not agree with the PBD Technical Strategy below:

*The technical strategy for completing the work scope contained within this PBD is to run one work shift beginning in FY00 and two shifts beginning in FY01 and continuing through FY03. A third shift will be worked for maintenance and surveillances that would normally preclude normal operations.*

On the basis of the PBD description, there should be a rise in the manhours at the beginning of FY01. The graph below shows a sharp increase in manhours in March of 2003. We recommend that K-H review the activity interface logic relationships of the decommissioning work to ensure that the PBD Technical Strategy is reflected in the 2006CPB Schedule.



2. Based on the range of Average Daily costs found for the following activity types, it appears that the basis for estimating costs or durations may not be consistent. Assuming the Original Durations of the activities represent a continuous effort, we recommend that K-H verify that the activity Original Durations and Budgeted Costs are accurate or make the necessary modifications to the 2006 CPB Schedule.

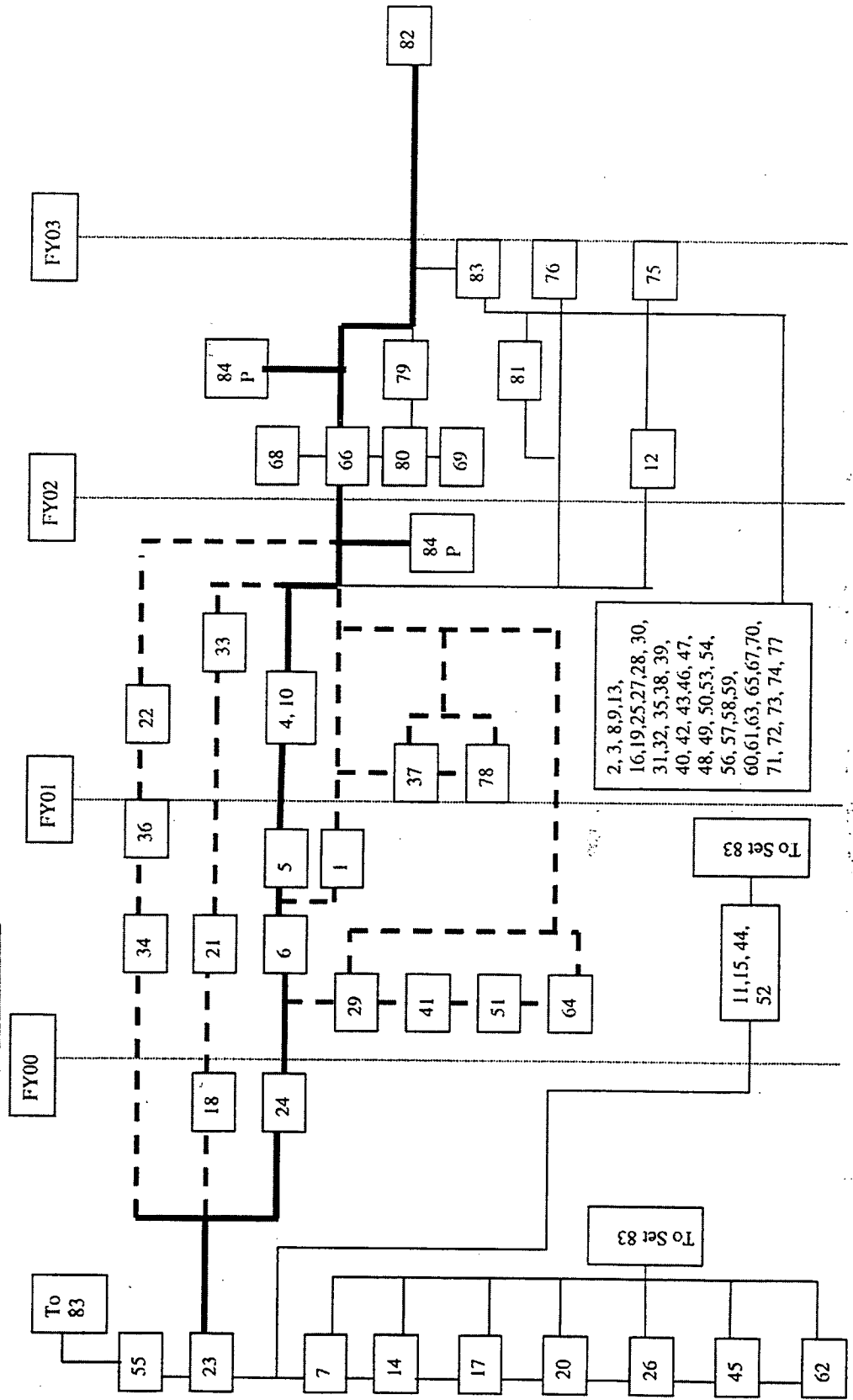
Activity Description	Average Daily Cost –	
	Low	High
Dismantlement Tasks	\$697	\$31,812
Proj Specif Long Lead Procurem't	\$641	\$22,144

# Building 776/777 - 2006 SET Prioritization

Readiness,  
Learning,  
Critical Path,  
Visual

D&D Technology Available

— Critical Path  
- - - Secondary Critical Path  
..... End of Year



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#### 4.4.4.5 PBD 022 – Building 779 Cluster Closure Project

##### *Approach*

The following comments, concerns and recommendations are the result of the team's review of those portions of the 2006 Closure Project Baseline (CPB) Schedule we felt were critical to site closure as scheduled in 2006. We did not review all of the 2006 CPB Schedule assumptions, scope and sequence; we reviewed a representative set of the Work Authorization Documents (WADs) within several critical Project Baseline Descriptions (PBDs). The comments below are organized by Work Authorization Documents (WADs) and Work Breakdown Structures (WBSs). The WADs reviewed in connection with the B779 Cluster Closure are:

- WAD 033 779 Cluster Project

##### *Basis & Assumption Issues*

#### WAD 033 – 779 Cluster Project

<b>K-H Project Management Plan Assumption</b>	<b>Comment</b>
1. Nevada Test Site (NTS) will remain open and accepts project remediation wastes.	Closure of or refusal by any receiver site would impact the schedule adversely, however, it is not clear from the information whether there is a contingency plan or what the actual impact to the schedule would be.
2. Enviro-Care will remain open and continue to accept LLMW.	See comment for #1 above.
3. WIPP will open and accept waste as currently generated/ packaged, compliant with RFETS procedures.	See comment for #1 above.
4. WIPP will be opened to receive waste by 9/30/98 or on-site storage available.	See comment for #1 above.
5. The MARSSIM should be applied as appropriate for RFETS in the planning and conduct of Final radiation surveys for facility free release.	It is not clear from the information what impact this assumption might have on the schedule.
6. Demolition of the 779 Cluster, as documented in the D&D completion report, will be accepted by RFFO as the only documentation required to demonstrate close-out of all Pu vulnerability corrective action milestones	It is not clear from the information what impact this assumption might have on the schedule.
7. A decision on necessity for, content, and approval of demolition plans for Bldg 729 and the other 779 Cluster facilities will be made by RFFO and the regulators in time to support project schedule, performance measures and milestones	We recommend that the statement "in time to support project schedule" be further defined by Milestones in the 2006 CPB Schedule.

**WBS 1.1.06.14.06 – Remediate/Contain 779 Cluster High Risk IHSS**

<b>K-H Project Management Plan Assumption</b>	<b>Comment</b>
1. The regulatory agencies will adhere to document review schedules as described in RFCA.	It is unknown if the 2006 CPB Schedule review Milestones have been presented and accepted by the regulatory agencies.
2. The regulatory agencies will approve the concept of an overall IA Characterization Plan that enables site specific planning information to be added as addenda.	It is not clear from the information who will approve this Plan or what impact it will have on the schedule if it is not approved.

***Scope Issues***

The PBD 022 and WAD 033 scope of work as stated in the Project documentation is required to achieve closure of the B779 cluster. The following scope does not appear to be included in the 2006 CPB Schedule:

## 1. WBS elements

- 1.1.06.14.03; 779 Cluster Deactivation (ADA) - COMPLETED
- 1.1.06.14.04.03; Bldg 779 Decommissioning, 779 Cluster
- 1.1.06.14.04.03.02; Characterization, B779 Decommissioning
- 1.1.06.14.04.10; Bldg 785 Decommissioning, 779 Cluster
- 1.1.06.14.04.11; Bldg 786 Decommissioning, 779 Cluster
- 1.1.06.14.04.12; Bldg 787 Decommissioning, 779 Cluster

## 2. Buildings 784, 785, 786 and 787 with individual activities for their removal.

## 3. SNM removal including holdup, however, the PBD documentation indicates that this removal was complete in FY96.

K-H stated that through FY98 (9/30/98), all completed activities were removed from the electronic copy of 2006 CPB Schedule. This may be the reason some of these activities do not appear in the 2006 CPB Schedule. If this work is not complete, we recommend that the scope be included in the 2006 CPB Schedule as outlined in the PBD.

***Schedule Development Issues*****WAD 033 - 779 Cluster Project**  
**General Comments/Questions**

- It appears that the 2006 CPB Schedule differs from the Rev. 7 (1/26/99) baseline Resource Leveled/Unconstrained Funding/Planning In The Year Prior To Decommissioning/Associated ER Activities Incorporated chart ("Eye-chart") with regard to IHSS activities and milestones shown below. The "Eye-chart" indicates that these activities will take place only in fiscal years 2003 and 2004. We recommend that K-H modify the Eye Chart to be in

alignment with the 2006 CPB Schedule.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Total Float
<b>1.1.06.14.06 REMEDIATE/CONTAIN 779 CLUSTER HIGH RISK</b>					
D3ER677100	SAP Preparation - IHSS Group 700-7 (B727/779)	60	01OCT01*	26DEC01	354
D3ER677110	SAP Approval by Agencies - IHSS Group 700-7	0		26DEC01	354
D3ER677120	Procurement and Field Prep - IHSS Group 700-7	15	27DEC01	17JAN02	354
D3ER677130	Contract Award - IHSS Group 700-7	0		17JAN02	354
D3ER677140	Readiness Assessment - IHSS Group 700-7	15	18JAN02	07FEB02	354
D3ER677150	Field Sampling, Lab Analysis - IHSS Group 700-7	75	08FEB02	23MAY02	354
D3ER677170	Prepare Summary/NFA - IHSS Group 700-7	90	24MAY02	01OCT02	354
D3ER677180	Prepare Decision Document - IHSS 700-7	135	09JUL02	20JAN03	354

2. The 2006 CPB Schedule indicates that there are 16 activities with an activity Original Duration of one day. Several examples 2006 CPB Schedule are listed below. We recommend that K-H verify the accuracy of these activity Original Durations and Budgeted Costs.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Total Float	Budgeted Cost
<b>D33 WAD 033 779 Cluster Project</b>						
<b>1.1.06.14.04.01 BLDG 727 DECOMMISSIONING, 779 CLUSTER</b>						
D309009110	Grid B727	1	06OCT99	06OCT99	1,728	41.42
D309009120	Final Survey B727	1	07OCT99	07OCT99	1,728	2,382.61
D309009130	Write Final Survey Report	1	08OCT99	08OCT99	1,728	4,215.08
D309009140	Complete Independent Review	1	11OCT99	11OCT99	1,728	15,000.00
D309009160	Demo Building 727	1	22OCT99	22OCT99	1,761	15,375.00
<b>1.1.06.14.04.03.01 B779 PLANNING &amp; ENGINEERING</b>						
D309005020	INWCP - Stripout (Utility Room 142, 127)	1	22FEB99	22FEB99	954	1.00
<b>1.1.06.14.04.03.05 DISMANTLEMENT, B779 DECOMMISSIONING</b>						
D309005100	Room 126 Removal	1	22FEB99	22FEB99	962	1.00
D309004120	Room 138 GB Hood Removal	1	22FEB99	22FEB99	974	1.00
D309004180	Room 220 GB & Hood Removal	1	22FEB99	22FEB99	987	1.00
D309001140	Remove Containment Tent Room 157	1	25FEB99	25FEB99	924	1.00
D309004400	Remove Cobalt Source	1	16AUG99	16AUG99	891	21,991.00
<b>1.1.06.14.04.03.06 DEMOLITION, B779 DECOMMISSIONING</b>						
D3779SSFEF	SS Fee B779	1	12AUG99*	12AUG99	892	1,647,147.00
D3779SSFEA	SS Fee B779	1	30DEC99	30DEC99*	1,715	3,020,000.00
<b>1.1.06.14.04.08 BLDG 783 DECOMMISSIONING, 779 CLUSTER</b>						
D309011110	Grid Building 783	1	04OCT99	04OCT99	1,738	41.42
D309011120	Final Survey Building 783	1	05OCT99	05OCT99	1,738	2,854.68
D309011160	Demolish Building 783	1	03NOV99	03NOV99	1,738	89,266.00

#### 1.1.06.14.04.01 – Bldg 727 Decommissioning, 779 Cluster

There appears to be a two-month slip between the 2010 and 2006 CPB Schedules due to logic changes which caused the driving logic relationship for activity D309009160, Demo Building 727 to change from the 2010 to 2006 CPB Schedules. The following issues may be related:

1. Activity D37RMVHAM, B727 REMOVAL, has a constrained start date of January 18, 1999 and the predecessor activity showed early finish of September 30, 1998. The reason for the “gap” between the completion of activity D3BEGWAD33, Begin WPD 33 – B779 Cluster

Closure Project, and the start of activity D37RMVHAM, B727 REMOVAL, is not apparent. The basis for the constraint is unknown. We recommend that K-H explain the constraints and replace the constraints with appropriate logic if necessary.

2. Activity D309009000, the IWCP for the B727 Stripout is forecast to March 24, 1999. The actual Stripout, Activity D309009100, shows an early start of September 20, 1999 and is driven by the predecessor Activity D309007140, Demolition of B779. The basis for the logic between the start of B727 Stripout and the Demolition of B779, which causes a six-month gap between the IWCP for B727 Stripout and the actual Stripout activity, cannot be determined from the information supplied. We recommend that K-H review the sequencing of this work as reflected in the 2006 CPB Schedule to ensure it reflects reasonable practices.

#### **1.1.06.14.04.02 – Bldg 729 Decommissioning, 779 Cluster**

1. Activity D391299185, Removal Asbestos, GB Heat Chambers, shows an activity Original Duration of 13 days, but no Budgeted Cost. We recommend that K-H verify the accuracy of this activity Original Duration and Budgeted Cost.

#### **1.1.06.14.04.03.01 – B779 Planning & Engineering**

1. D309005020, IWCP - Stripout (Utility Room 142, 127) has an activity Original Duration of one-day. We recommend that K-H verify the accuracy of this activity Original Duration and Budgeted Cost.

#### **1.1.06.14.04.03.06 – Demolition, B779 Decommissioning**

The overall WBS indicates a slip of two months from the 2010 CPB Schedule to the 2006 CPB Schedule due to logic changes which caused the driving logic relationship for activity D391201094, Complete Stripout & Demolition of 779 Cluster to change from the 2010 to 2006 CPB Schedules. The following issues may be related:

1. Activity D391201095, Demo & Building Rubble Waste Removal of B729, has no duration and indicates a variance of five months. The change in the 2006 CPB Schedule appears to be caused by the addition of a driving logic relationship to this activity. We note that the 2006 CPB Schedule designates this activity as a Milestone, however, by its activity description it appears to be a task. We also note that this activity is not in WBS 1.1.06.14.04.02, Bldg 729 Decommissioning, which already has an activity for Demo Bldg 729 (D391299540) and another for B729 Removal (D309013110). It appears that there may be a duplication of scope in the 2006 CPB Schedule. We recommend that K-H review these activities and make the necessary modifications to the 2006 CPB Schedule.
2. The activities shown below all have the same description, Demolition of Building 779, but different Budgeted Costs and Original Durations. We recommend that K-H verify the accuracy of these activity Original Durations and Budgeted Costs.

Activity ID	Activity Description	Original Duration	Early Start	Early Finish	Total Float	Budgeted Cost	Cost per Day
D309007140	Demolition of Building 779	24	16-Aug-99	17-Sep-99	867	\$330,802	\$ 13,783
D391201093	Demolition of Building 779	24	16-Aug-99	17-Sep-99	1,777	\$ 0	\$ 0
D30900714A	Demolition of Building 779	3	20-Sep-99	22-Sep-99	867	\$599,466	\$199,822

3. Activity D391201098, Complete Final Radiation Survey for Demolition, and Activity D391201090, Comp. Removal of Remaining Gloveboxes (est. 43) both show constrained finish dates later than the demolition of B779. The basis for the constraint dates can not be determined with the available information. We recommend that K-H explain the basis of the constraints and add the logic relationships between these activities be revised/added to better reflect the demolition sequencing and reasonable construction practices.

#### 1.1.06.14.04.03.07 – Project & Operations MGMT, B779 Decommissioning

1. This WBS indicates a slip of two months from the 2010 CPB Schedule to the 2006 CPB Schedule which appears to be caused by the extension of the Original Duration on activity D37790370A, Closeout Documentation. The basis for the extended duration can not be determined through the available documentation. We recommend that K-H explain the basis for the extended duration as well as their potential recovery plan.

#### 1.1.06.14.04.03.08 – Support Services, B779 Decommissioning

1. This WBS indicates an overall acceleration of 33 months from the 2010 CPB Schedule for the completion of cluster closure due to predecessor logic changes from the 2010 to the 2006 CPB Schedule. These changes, coupled with the decreased Original Duration of Activity D3CTER010, 779 Cluster Closure, from one year to approximately three months, appear to account for the variance in the 2006 CPB Schedule. We recommend that K-H explain the basis for shortened Original Duration.
2. Activity D3CTER010, 779 Cluster Closure, has a driving logic relationship predecessor is Activity D3779SSFEA, SS Fee B779, which is a fee related milestone as opposed to a work related activity. We recommend that K-H revise the logic relationship to Activity D3CTER010, 779 Cluster Closure, to better reflect the demolition sequencing and reasonable construction practices.

#### 1.1.06.14.04.04 – B780 Decommissioning, 779 Cluster

Most of the activities in this WBS remain to be completed at this time. The schedule indicates an overall slip of four months due to predecessor logic changes from the 2010 to the 2006 CPB Schedule. The following issues may be related:

1. Activity D301298670, Demo Bldg 780, precedes activities that provide for Stripout, Engineering Surveying, etc., in B780. The sequence is shown below. We recommend that

K-H revise the logic relationships between these activities to better reflect the demolition sequencing and reasonable construction practices.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Total Float
<b>1.1.06.14.04.04 BLDG 780 DECOMMISSIONING, 779 CLUSTER</b>					
D301298549	B780 REMOVAL HAMMOCK	17	18JAN99	09FEB99	1,610
D301298670	Demo Bldg 780	16	08FEB99	01MAR99	1,610
D309010000	Engineering - B780, A, B	23	08FEB99*	10MAR99	1,610
D309010100	Stripout - B780, A, B	37	20SEP99	09NOV99	1,476
D309010110	Grid B780, 780A, 780B	3	29OCT99	02NOV99	1,476
D309010120	Final Survey B780, 780A, 780B	5	03NOV99	09NOV99	1,476
D309010130	Write Final Survey Report for B780, 780A, 780B	4	10NOV99	15NOV99	1,476
D309010140	Complete Independent Reveiw for B780, 780A, 780B	4	16NOV99	19NOV99	1,476
D309010150	DOE Approve Final Survey Report B780, 780A, 780B	8	22NOV99	03DEC99	1,476
D309010160	Demo & Waste Removal B780, 780A, 780B	5	06DEC99	10DEC99	1,476

- Activity D309010100, Stripout – B780, A, B, has a driving logic relationship predecessor of Activity D309007140, Demolition of Bldg 779. The basis of the logic between the Stripout – B780 and the Demolition of Bldg 779 is not apparent. Additionally, this causes a six-month gap from the completion of the Engineering – Bldg 780, A, B, Activity D309010000, to the stripout activity. We recommend that K-H revise the logic relationships between these activities to better reflect the demolition sequencing and reasonable construction practices.

#### **1.1.06.14.04.05 – B780A Decommissioning, 779 Cluster**

- Activity D3A1298549, 780A Removal hammock, has a one-month Original Duration but no Budgeted Cost. We recommend that K-H verify the accuracy of this Budgeted Cost and make the necessary modification to the 2006 CPB Schedule

#### **1.1.06.14.04.06 – B780B Decommissioning, 779 Cluster**

- Activity D3B1298549, 780B Removal hammock, has a one-month Original Duration but no Budgeted Cost. We recommend that K-H verify the accuracy of this Budgeted Cost.

#### **1.1.06.14.04.07 – B782 Decommissioning, 779 Cluster**

The 2006 CPB Schedule indicates an overall variance of -3 months from the 2010 CPB Schedule due to predecessor logic changes from the 2010 to the 2006 CPB Schedule. The following issues may be related:

- Activity D309008000, IWCP - B782 (Stripout), has a constrained start. The basis for this constraint is unknown. We recommend that K-H explain the constraint and replace the constraint with appropriate logic if necessary.
- Activity D309008100, Bldg 782 Stripout, has a driving predecessor of activity D309007140, Demolition of Bldg 779. The basis of the logic between the Stripout – B782 and the

Demolition of Bldg 779 is not apparent. Additionally, this causes a six-month gap from the completion of the IWCP activity and the start of the stripout and final survey activities. We recommend that K-H revise the logic relationships between these activities to better reflect the demolition sequencing and reasonable construction practices.

#### **1.1.06.14.04.08 – B783 Decommissioning, 779 Cluster**

The 2006 CPB Schedule indicates an overall variance of -3 months from the 2010 CPB Schedule due to predecessor logic changes from the 2010 to the 2006 CPB Schedule. The following issues may be related:

1. Activity D309011000, Engineering - CT & Pump House, has a constrained start. The basis for this constraint is unknown. We recommend that K-H explain the constraint and replace it with appropriate logic if necessary.
2. Activity D309011100, Stripout – CT Pump House 783, has a driving logic relationship predecessor with activity D309007140, Demolition of Bldg 779. The basis of the logic between the Stripout – B783 and the Demolition of Bldg 779 is not apparent. Additionally, this causes a six-month “gap” from the completion of the engineering activity and the start of the stripout activity. We recommend that K-H revise the logic relationships between these activities to better reflect the demolition sequencing and reasonable construction practices.
3. The 2006 CPB Schedule indicates that activity D309011160, Demolish Bldg 783, has an Original Duration of one day. We recommend that K-H verify the activity Original Duration for accuracy.

#### **1.1.06.14.06 – Remediate/Contain 779 Cluster High Risk**

1. The schedule indicates an overall delay of 27 months from the 2010 CPB Schedule to the 2006 CPB Schedule for this WBS. This work is not forecast to begin until October 1, 2001 (FY02). All activities in this WBS have been added to the 2006 CPB Schedule with the exception of the cluster completion Milestone. We recommend that K-H explain the impact and their potential recovery plan.
2. Activity D3ER677100, SAP Preparation – IHSS Group 700-7 (B727/779), has a constrained start date of October 1, 2001. The predecessor to this activity is the Demolition of B779 which is indicated to be complete in September of 1999. This creates a 21-month “gap” from finish of B779 demolition to the start of the SAP Preparation. The basis for this constraint is unknown. We recommend that K-H explain the constraint and replace it with appropriate logic if necessary.

### Cost & Resource Loading Issues

1. The 2006 CPB Schedule indicates that there are 63 activities that have an Original Duration but no Budgeted Cost. The 2006 CPB Schedule also indicates that there are 35 activities that have an Original Duration and a Budgeted Cost of \$1.00. A sample from the 2006 CPB Schedule is listed below. We recommend that K-H verify the activity Original Durations and Budgeted Costs for accuracy.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
D3OH0234	REMOVE OVERHEAD thru FINAL SURVEY RM 234	6	04JAN99	11JAN99
D3OH0152	REMOVE OVERHEAD thru FINAL SURVEY RM 152	11	06JAN99	20JAN99
D3OH0160A	REMOVE OVERHEAD thru FINAL SURVEY RM 160a	21	07JAN99*	04FEB99
D3OH0156	REMOVE OVERHEAD thru FINAL SURVEY RM 156	18	08JAN99	02FEB99
D3OH0234C	REMOVE OVERHEAD thru FINAL SURVEY RM	23	12JAN99	11FEB99
D3OH0234A	REMOVE OVERHEAD thru FINAL SURVEY RM	2	13JAN99	14JAN99
D3OH0234D	REMOVE OVERHEAD thru FINAL SURVEY RM	10	15JAN99	28JAN99
D309004310	Size Reduce GB's Floor #1 Rm 137/140 & Rm 133	70	15JAN99	22APR99
D3OH0225	REMOVE OVERHEAD thru FINAL SURVEY RM 225	27	19JAN99	24FEB99
D3OH0170	REMOVE OVERHEAD thru FINAL SURVEY RM	9	21JAN99	02FEB99
D391225551	House Cleaning Room 144	17	28JAN99	19FEB99
D3OH0144	REMOVE OVERHEAD thru FINAL SURVEY RM 144	17	28JAN99	19FEB99
D391226553	House Cleaning Room 145	13	03FEB99	19FEB99
D3OH0145	REMOVE OVERHEAD thru FINAL SURVEY RM 145	14	03FEB99	22FEB99
D3OH0147	REMOVE OVERHEAD thru FINAL SURVEY RM 147	9	09FEB99	19FEB99
D3OH00A23	OH-FINAL 100-111, 118-120, 24,25, 28-30,32, 34-3	32	09FEB99	24MAR99
D391226571	House Cleaning Room 151	3	16FEB99	18FEB99
D3OH0151	REMOVE OVERHEAD thru FINAL SURVEY RM 151	4	16FEB99	19FEB99
D309005100	Room 126 Removal	1	22FEB99	22FEB99
D309004120	Room 138 GB Hood Removal	1	22FEB99	22FEB99
D309004180	Room 220 GB & Hood Removal	1	22FEB99	22FEB99
D309004160	Room 218 GB & Hood Removal	7	22FEB99	02MAR99
D309003200	Admin Area Floor #1 - Remove Zone 1A Duct	17	22FEB99	16MAR99
D321296098	B782 Removal Hammock	18	22FEB99	17MAR99



#### 4.4.5 Waste Management

##### *Approach*

The following comments, concerns and questions are the result of the team's review of those portions of the 2006 Closure Project Baseline (CPB) Schedule we felt were critical to site closure as scheduled in 2006. We did not review all of the 2006 CPB Schedule assumptions, scope and sequence; we reviewed a representative set of the Work Authorization Documents (WADs) within several critical Project Baseline Descriptions (PBDs). The comments below are organized by (WADs) and Work Breakdown Structures (WBSs). The selected WADs were representative of the top 80% of the cost for WM.

The WADs reviewed in connection with the PBD 002 WM Project are:

- WAD 002 Sanitary Waste Project
- WAD 004 TRU/TRUM Project
- WAD 005 TRU/TRUM Construction Project
- WAD 006 Waste Disposal Project(non-TRU)
- WAD 007 Waste Treatment Project
- WAD 048 Liquid Waste Treatment Upgrades
- WAD 062 LLW/LLMW Storage Project

##### *Basis & Assumption Issues*

See Section 4.1 for comments regarding planning and assumptions. Also see Section 4.6 for additional Waste Management information.

##### *Scope Issues*

1. The current process for waste management and planning is accomplished through the Waste Generation, Inventory, and Shipping Forecast published by the Waste & Remediation Operations Group (Appendix C). This document is a compilation of waste forecasts produced by the Waste Generators, updated monthly, and published on a quarterly basis and provided to Waste Management. This Waste Generation, Inventory, and Shipping Forecast (WGISF) is the current WM planning and forecasting mechanism and is separate from the 2006 CPB Schedule. Hence the majority of the WM Project schedule activities within PBD 002 Waste Management Project have been incorporated as a LOE and do not appear to reflect interface relationships between the waste generation areas and the appropriate waste management as stated above. The WGISF Process appears to be the best approach at this time for the out years. However, for FY99 and FY00 there is sufficient information available from the Waste Generation groups for the integration of this WM information to be integrated into the 2006 CPB Schedule.

2. In response to the lack of WM integration logic, ER has created their own WM activities (that are not maintained by WM) for waste treatment and management to represent the interface to the WM effort. This presents several problems:
  - WM is not responsible for the status of these activities added by ER and therefore they may not reflect accurate WM status.
  - Since there is no interface logic to the actual WM activities, changes to these activities would not translate down to the ER activity forecasts.
  - The ER added activity Original Duration (for WM activities) calculations are not from WM and may not be in accordance with WM assumptions.
3. The K-H staff have stated that they perform monthly monitoring and quarterly forecast updates of resources to make adjustments in D&D and ER plans necessary to support closure. However these planning activities are not included in the 2006 CPB schedule D&D and ER activity forecasts. This subsequently impacts WM's ability to accurately forecast, schedule and integrate their activities within the 2006 CPB Schedule. K-H has stated that current waste generation forecasts are generally plus or minus 40% accuracy and as additional historical data becomes available the forecasting will improve.
4. The K-H Schedule Standard 17 Schedule Integration states the Expanded Management Summary Schedule (EMSS) all RFCP milestones shall be uniquely identified, and traceable between the EMSS and CPB Schedule as shown from the following excerpt:

*"The Expanded Management Summary Schedule (EMSS) serves as the primary RFCP schedule integration tool ... The EMSS shall tie to the CPB ... All summary activities represented on the EMSS shall tie to the activity nodes in the CPB."*

A review of the 2006 CPB Schedule Milestones identified in the WAD reviewed have been verified to tie to the EMSS.

5. The work scope described in the PBD 002 for the for WADs listed within were reviewed with the WBS (WAD-let) activities to determine whether the PBD scope was accurately represented in the 2006 CPB Schedule.

## Schedule Development Issues

### WAD 002 – Sanitary Waste Project

The Sanitary Waste Project includes operation of the RFETS Sewage Treatment Plant (STP). Non-hazardous, non-radioactive, liquid waste are received at the STP; treated using activated sludge, tertiary clarification, sand filtration and UV light disinfection; and discharged to a stream.

#### 1.1.04.01.06 219 – Cluster Landfill Closure (OU7)

1. This LOE work scope is described in the PBD as operations and maintenance activities at the OU-7 seep collection and treatment facility (i.e., passive aeration system). The work activities under this WBS include weekly inspections, sample collection and analysis, quarterly reporting and maintenance, modeling and analyses to support the update of the IM/IRA and conceptual design. These the 2006 CPB Schedule WBS activities are represented, as shown below:

Activity ID	Activity Description	Orig Dur	Total Float	Early Start	Early Finish	2010 Early Finish	2010 Variance
<b>002: PBD 002: Waste Management Project</b>							
<b>002: WAD 002: Sanitary Waste Project</b>							
<b>1.1.04.01.06 219 CLUSTER LANDFILL CLOSURE (OU7)</b>							
A207CAP100	EVALUATE TOTAL WATER STORAGE CAPACITY OF	82	62	02OCT00	29JAN01		0
A2CP100110	PERFORM WATER BALANCE STUDY	62	62	30OCT00	29JAN01		0
A2CP100170	MODEL DIFFERENCES RMA & RFETS (SOIL	103	62	30JAN01	22JUN01		0
A2CP100120	DEMONSTRATE RFCA ATTACHMENT 10	141	63	30JAN01	16AUG01		0
A2CP100180	EVALUATE SOIL FROM ONSITE AND OFFSITE	39	62	25JUN01	17AUG01		0
A2CP100190	PERFORM MODELING WITH UNSAT-H (SOILS)	29	62	20AUG01	28SEP01		0
A2CP100010	Project Scoping & Conceptual Cap Design Prep	181	135	01OCT01	17JUN02		0
A2CP100000	Decision Document Preparation, Review & Approval	254	62	01OCT01	30SEP02		0
A2CP100090	OU7 Landfill Decision Doc Approved by Agencies	0	62		30SEP02		0
A2CP100060	Procure Design & Build Subcontract	37	62	01OCT02	20NOV02		0
A2CP100080	OU-7 Landfill Cap Contract Award	0	62		20NOV02		0
A2CP100050	Title II/Title III Design	217	62	21NOV02	30SEP03		0
A2CP100140	Field Document Preparation	40	62	01OCT03	25NOV03		0
A2CP100130	Readiness Assess/Environ Readiness Evaluation	18	62	26NOV03	23DEC03		0
A2EASR5000	OU-7 CAD/ROD Support	255	499	12DEC03	13DEC04		0
A2CP100070	OU7 Cap Construction	197	62	24DEC03	30SEP04		0
A2EMILE562	Crmp INFLFO Cluster (Sanitary Landfill) Cap	0	62		30SEP04	30SEP05	254
A2CP100150	Prepare Closeout Report	20	499	01OCT04	28OCT04		0
A2EASR4000	OU-7 Landfill Cap Long Term Maint. & Monitoring	254	62	01OCT04	30SEP05	29SEP06	253
A2CP100160	OU-7 Landfill Closeout Rpt Submitted to Agencies	0	499		28OCT04		0
A2EMILE621	OU7 ROD Prepared	0	499		13DEC04		0
A2EASR4005	OU-7 Landfill Cap Long Term Maint. & Monitoring	253	62	03OCT05	29SEP06	28SEP07	253

2. As shown above, the majority of activities representing this WBS appear to have been added to the 2006 CPB Schedule since the 2010 CPB Schedule development. However, the Milestones for Complete INFLFO Cluster, OU-7 Landfill Cap Maintenance for FY05 and FY06 are forecast to complete approximately one year earlier than the 2010 CPB Schedule. The basis for the acceleration is the result of a decrease in duration for cap construction, a shortened period of planning, and a greater level of work scope detail being defined leading up to the predecessor.
3. When the predecessor and successor logic was reviewed for the WBS sequence of activities, the 2006 CPB Schedule activities were found to be logically and correctly tied with each other. However, the first driving activity, A2O7CAP100 Evaluate Total Water Storage Capacity, of the sequence was found to be tied to a date constrained Milestone (as opposed to a related waste generation activity), which does not have a predecessor activity.
4. Activity A2CP100000 "Decision Document Preparation, Review and Approval" combines responsibilities of different parties. Industry standard schedule techniques separate activities by scope and responsibilities. The regulatory agencies are also assumed to adhere to document review schedules as described in RFCA and it is important from a schedule impact and delay allocation perspective to separate this effort. In accordance with the K-H Standard 10 Scheduling, we recommend that each responsibility have its own 2006 CPB Schedule activity.
5. The last activity in this WBS (A2EAER4005) is properly tied into the WAD 002 and the PBD 002 completion Milestones as shown below.

Activity ID	Activity Description	Orig Dur	Total Float	Early Start	2006 Finish	FY06	FY07
A2EAER4005	OU-7 Landfill Cap Long Term Maint. & Monitoring	253	62	03OCT05	29SEP06		
A2ENDWPD02	Complete WPD 002 - Sanitary Waste Project	0	62		29SEP06		
A6ENDPBD02	Complete PBD 002 - Waste Management Project	0	61		02OCT06		
E5MMILE099	Site Closure Complete	0	0		29DEC06		

#### 1.1.04.01.07 – Operate and Maintain Existing Landfill

1. This LOE scope is described in the PBD as collection, transportation and disposal of RFETS-generated solid, sanitary waste to offsite commercial landfill. Additionally, it is described as maintaining the existing vegetative soil cover, visual inspections, and groundwater monitoring. The activity process and sequence is repeated for each fiscal year. These LOE activities for FY99 through FY06 are adequately represented in the 2006 CPB Schedule as shown below.

Activity ID	Activity Description	Orig Dur	Total Float	Early Start	Early Finish	FY99	FY00
<b>002 PBD 002 - Waste Management Project</b>							
<b>002 WAD 002 - Sanitary Waste Project</b>							
<b>1.1.04.01.07 OPERATE AND MAINTAIN EXISTING LANDFILL</b>							
A2EA171020	Existing Landfill Maintenance & Monitoring FY99	254	62	01OCT98	30SEP99		
A2EA172020	Inspections & Program Mgmt Sanitary Waste, FY99	254	62	01OCT98	30SEP99		
A2EA172025	Offsite Sanitary Waste Disposal Subcontract FY99	254	62	01OCT98	30SEP99		
A2EA172040	Inspections & Program Mgmt Sanitary Waste, FY00	254	62	01OCT99	29SEP00		
A2EA172100	Offsite Sanitary Waste Disposal Subcontract FY00	254	62	01OCT99	29SEP00		
A2EAWM9015	Existing Landfill Maintenance & Monitoring FY00	254	62	01OCT99	29SEP00		

2. As indicated below the majority of activities representing this WBS reflect zero variance from the 2010 CPB Schedule forecasts. However, the Milestone for Complete Sanitary Waste Shipments is forecast approximately three years earlier than the 2010 CPB Schedule forecast. The basis for the acceleration is the result of a refined effort to complete offsite waste shipments three years early.

Activity ID	Activity Description	Orig Dur	Total Float	Early Start	Early Finish	2010 Early Finish	2010 Variance
<b>002 PBD 002 - Waste Management Project</b>							
<b>002 WAD 002 - Sanitary Waste Project</b>							
<b>1.1.04.01.07 OPERATE AND MAINTAIN EXISTING LANDFILL</b>							
A2EA171020	Existing Landfill Maintenance & Monitoring FY99	254	62	01OCT98	30SEP99	30SEP99	0
A2EA172020	Inspections & Program Mgmt Sanitary Waste, FY99	254	62	01OCT98	30SEP99	30SEP99	0
A2EA172025	Offsite Sanitary Waste Disposal Subcontract FY99	254	62	01OCT98	30SEP99	30SEP99	0
A2EA172040	Inspections & Program Mgmt Sanitary Waste, FY00	254	62	01OCT99	29SEP00	29SEP00	0
A2EA172100	Offsite Sanitary Waste Disposal Subcontract FY00	254	62	01OCT99	29SEP00	29SEP00	0
A2EAWM9015	Existing Landfill Maintenance & Monitoring FY00	254	62	01OCT99	29SEP00	29SEP00	0
A2EA172045	Inspections & Program Mgmt Sanitary Waste, FY01	253	62	02OCT00	28SEP01	28SEP01	0
A2EA172105	Offsite Sanitary Waste Disposal Subcontract FY01	253	62	02OCT00	28SEP01	28SEP01	0
A2EAWM9200	Existing Landfill Maintenance & Monitoring FY01	253	62	02OCT00	28SEP01	28SEP01	0
A2EA172050	Inspections & Program Mgmt Waste, FY02	254	62	01OCT01	30SEP02	30SEP02	0
A2EA172110	Offsite Sanitary Waste Disposal Subcontract FY02	254	62	01OCT01	30SEP02	30SEP02	0
A2EAWM9205	Existing Landfill Maintenance & Monitoring FY02	254	62	01OCT01	30SEP02	30SEP02	0
A2EA172055	Inspections & Program Mgmt Sanitary Waste, FY03	254	62	01OCT02	30SEP03	30SEP03	0
A2EA172115	Offsite Sanitary Waste Disposal Subcontract FY03	254	62	01OCT02	30SEP03	30SEP03	0
A2EAWM9210	Existing Landfill Maintenance & Monitoring FY03	254	62	01OCT02	30SEP03	30SEP03	0
A2EA172060	Inspections & Program Mgmt Sanitary Waste, FY04	255	62	01OCT03	30SEP04	30SEP04	0
A2EA172120	Offsite Sanitary Waste Disposal Subcontract FY04	255	62	01OCT03	30SEP04	30SEP04	0
A2EA172065	Inspections & Program Mgmt Sanitary Waste, FY05	254	62	01OCT04	30SEP05	30SEP05	0
A2EA172125	Offsite Sanitary Waste Disposal Subcontract FY05	254	62	01OCT04	30SEP05	30SEP05	0
A2EA172070	Inspections & Program Mgmt Sanitary Waste, FY06	253	62	03OCT05	29SEP06	29SEP06	0
A2EA172130	Offsite Sanitary Waste Disposal Subcontract FY06	253	62	03OCT05	29SEP06	29SEP06	0
A2EMILE543	Complete Sanitary Waste Shipments	0	62		29SEP06	30SEP09	762
A2ENDWPD02	Complete WPD 002 - Sanitary Waste Project	0	62		29SEP06		0

3. The last activity for this WBS is logically and correctly tied to the WAD and PBD completion Milestones as shown below.

Activity ID	Activity Description	Orig Dur	Total Float	Early Start	2006 Finish	FY06 FY07	
A2EAER4005	OU-7 Landfill Cap Long Term Maint. & Monitoring	253	62	03OCT05	29SEP06		
A2ENDWPD02	Complete WPD 002 - Sanitary Waste Project	0	62		29SEP06		
A6ENDPBD02	Complete PBD 002 - Waste Management Project	0	61		02OCT06		
E5MMILE039	Site Closure Complete	0	0		29DEC06		

### WAD 004 – TRU/TRM Waste Projects

Under this WAD, Legacy TRU/TRM waste will require continued onsite storage pending certification for offsite shipment. Additionally, newly generated TRU/TRM will require onsite storage to the extent it can not be shipped for disposal at WIPP in the same year it is generated. To accommodate this need, WAD 004 includes the continued operation of the existing TRU/TRM storage/staging facilities across the site. Specific storage/staging facilities are included in Buildings B664, 776, 440, 569, 991 and possibly other facilities as they are modified for storage.

WAD 004 also covers operations and maintenance for new facilities that will be required for storage of TRU/TRM pending shipment to WIPP. Based on current inventory and projected generation, additional storage capacity will be required by the end of FY00 (independent of WIPP opening). It is anticipated that such capacity will be acquired through renovation of existing facilities and operations will be planned accordingly.

#### **1.1.04.03.01.02 – B664 TRU/TRM Storage/Staging Operations**

1. The scope for this element includes a variety of activities required to maintain safe and compliant storage of TRU/TRM waste in B664. Typical activities include routine functions associated with operations management, operations of testing systems, maintenance of loading systems, performance checks, training, and other environment, safety and health activities. As indicated below, the entire work scope for B664 TRU/TRM Storage/Staging Operations appears to be adequately represented in the 2006 CPB Schedule for this WBS.

Activity ID	Activity Description	Orig Dur	Total Float	Early Start	Early Finish	2010 Early Finish	2010 Variance
<b>002 PBD 002 - Waste Management Project</b>							
<b>004 WAD 004 - TRU/TRM Project</b>							
<b>1.1.04.03.01.02 B664 TRU/TRM STORAGE/STAGING OPS</b>							
A4EC121020	B664 TRU/TRM Storage Operations FY99	254	268	01OCT98	30SEP99	30SEP99	0
A4EC121040	B664 TRU/TRM Storage Operations FY00	254	268	01OCT99	29SEP00	29SEP00	0
A4EC121045	B664 TRU/TRM Storage Operations FY01	253	268	02OCT00	28SEP01	28SEP01	0
A4EC121050	B664 TRU/TRM Storage Operations FY02	254	268	01OCT01	30SEP02	30SEP02	0
A4EC121055	B664 TRU/TRM Storage Operations FY03	254	268	01OCT02	30SEP03	30SEP03	0
A4EC121060	B664 TRU/TRM Storage Operations FY04	255	268	01OCT03	30SEP04	30SEP04	0
A4EMILE481	Complete B664 Waste Operations	0	268		30SEP04	30SEP08	1,015

2. As shown above, the 2006 CPB Schedule activities representing this WBS reflect no completion variances when compared to the 2010 CPB Schedule. However, the finish Milestone A4EMILE481 reflects a four-year acceleration from the 2010 CPB Schedule forecast. A review of the 2010 CPB schedule reflects a change in scope and approach as the basis for the acceleration.
3. Activity A4EC121020, B664 TRU/TRM Storage Operations FY99, has only one predecessor activity, A4BEGWPD004 Start WPD 004 Milestone, which is driven by a FY99 Start Milestone date constraint. With a review of the scope and understanding of the WM process, the observation can be made that the B664 TRU/TRM Storage Operations is dependent upon the Building B664 waste generation activities that precede the use of this building. We recommend the contractor review of the driving activities and current scope for A4EC121020, B664 TRU/TRM Storage Operations FY99 and FY00 and provide the necessary activities and logic relationships to reflect the current FY and FY+1 efforts.

Activity ID	Activity Description	Orig Dur	Total Float	Early Start	Early Finish	2010 Early Finish	2010 Variance	FY04
<b>002: PBD 002 - Waste Management Project</b>								
<b>004: WAD 004 - TRU/TRM Project</b>								
<b>1.1.04.03.01.02: B664 TRU/TRM STORAGE STAGING OPS</b>								
A4EC121020	B664 TRU/TRM Storage Operations FY99	254	268	01OCT98	30SEP99	30SEP99	0	
A4EC121040	B664 TRU/TRM Storage Operations FY00	254	268	01OCT99	29SEP00	29SEP00	0	
A4EC121045	B664 TRU/TRM Storage Operations FY01	253	268	02OCT00	28SEP01	28SEP01	0	
A4EC121050	B664 TRU/TRM Storage Operations FY02	254	268	01OCT01	30SEP02	30SEP02	0	
A4EC121055	B664 TRU/TRM Storage Operations FY03	254	268	01OCT02	30SEP03	30SEP03	0	
A4EC121060	B664 TRU/TRM Storage Operations FY04	255	268	01OCT03	30SEP04	30SEP04	0	
A4EMILE481	Complete B664 Waste Operations	0	268		30SEP04	30SEP08	1,015	
G700066420	Deactivation - Cluster 664	254	268	02OCT03	30SEP04	26DEC08	1,075	

4. As indicated in the figure above, a review of the predecessor/successor relationships finds that Storage Operations in B664 for FY04 are scheduled concurrently with B664 Deactivation in FY04. There is a concern as to the reasonableness of the concurrent (as opposed to sequential) scheduling of Bldg 664 deactivation and waste storage operation activities. We recommend that K-H ensure that this sequencing is reasonable and is in accordance with DOE assumptions.

#### 1.1.04.03.01.03 – B776 TRU/TRM Storage/Staging Operations

1. The scope for this WBS includes a variety of activities to maintain safe and compliant storage in B776. Typical activities include operations management, operation and management of gas generation test systems, operation and maintenance of repack and visual examination operations, building personnel training/qualifications, compliance reviews, surveillance's, and other project management tasks. We anticipate that TRU/TRM operations in B776 will be eliminated by end of FY99 and all operations transferred to B440 or converted to mobile systems for characterization. The work scope for B776 TRU/TRM Storage/Staging Operations is adequately represented in the 2006 CPB Schedule for this WBS.

2. The activities adequately representing this WBS reflected no completion variances when compared to the 2010 CPB Schedule. However, the completion Milestone for B776 Evacuation is forecast approximately one year earlier than the 2010 CPB Schedule forecast as shown below. The basis for the acceleration is a result of deletion of B776 Storage Operations for FY00.

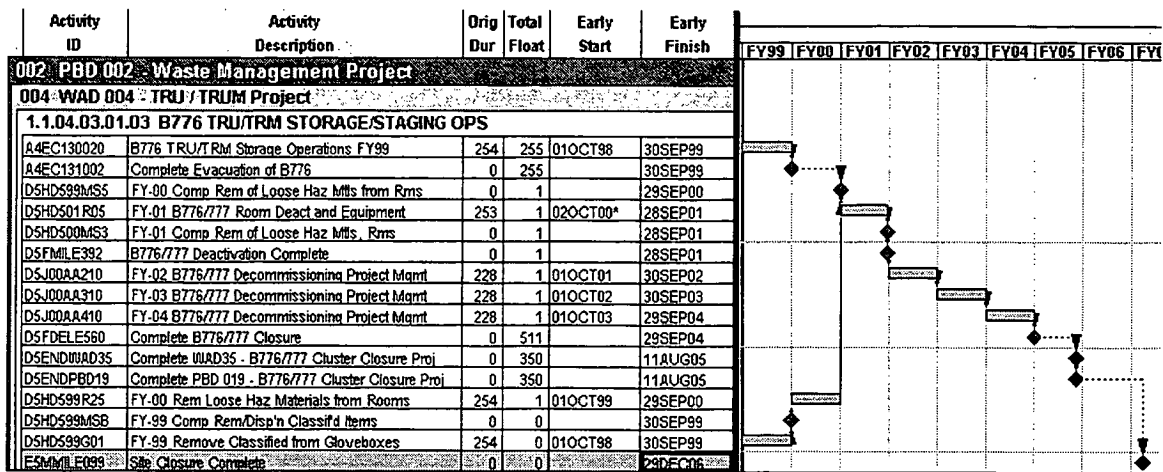
Activity ID	Activity Description	Orig Dur	Total Float	Early Start	Early Finish	2010 Early Finish	2010 Variance	
<b>002 PBD 002 - Waste Management Project</b>								
<b>004 WAD 004 - TRU / TRUM Project</b>								
<b>1.1.04.03.01.03 B776 TRU/TRM STORAGE/STAGING OPS</b>								
A4EC130020	B776 TRU/TRM Storage Operations FY99	254	255	01OCT98	30SEP99	30SEP99	0	
A4EC131002	Complete Evacuation of B776	0	255		30SEP99	29SEP00	254	

3. Activity A4EC131002, Complete Evacuation of B776, is forecast to complete September 30, 1999. However, the figure below shows Building 776 Deactivation (PBD 019) and completion of Removal of Loose Hazardous Materials from the Rooms ongoing through FY00. There is a concern as to the reasonableness of the concurrent (as opposed to sequential) scheduling of Building 776/777 deactivation and waste storage operation activities. We recommend that K-H ensure that this sequencing is reasonable and is in accordance with DOE assumptions.

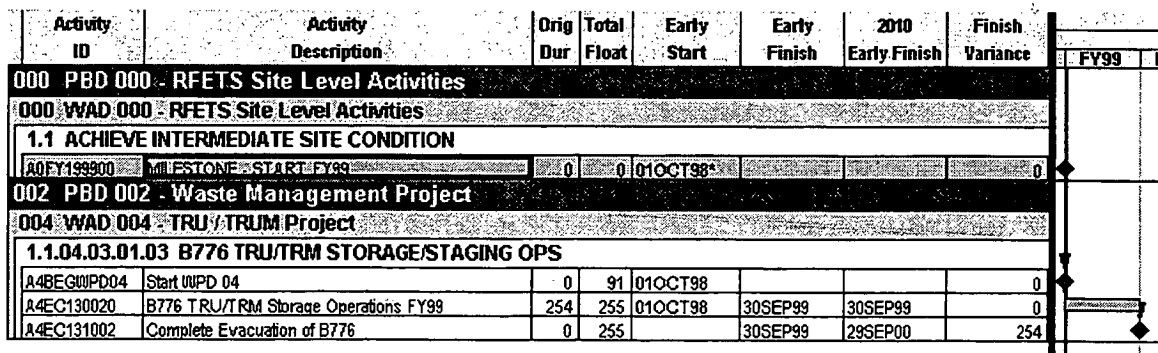
Activity ID	Activity Description	Orig Dur	Total Float	Early Start	Early Finish	2010 Early Finish	2010 Variance		FY99	FY00
<b>02 PBD 002 - Waste Management Project</b>										
<b>004 WAD 004 - TRU / TRUM Project</b>										
<b>1.1.04.03.01.03 B776 TRU/TRM STORAGE/STAGING OPS</b>										
A4EC130020	B776 TRU/TRM Storage Operations FY99	254	255	01OCT98	30SEP99	30SEP99	0			
A4EC131002	Complete Evacuation of B776	0	255		30SEP99	29SEP00	254			
<b>19 PBD 019 - Building 776 / 777 Cluster Closure</b>										
<b>135 WAD 035 - 776 / 777 Cluster Project</b>										
<b>1.1.06.12.01 776/777 CLUSTER LANDLORD FUNCTIONS</b>										
D5BEGWPD35	Start WPD 35	0	0	01OCT98			0			
<b>1.1.06.12.03.02 776/777 CLUSTER DEACT PLAN AND PROJ MGMT</b>										
D5HD299P00	FY99 B776 Deact Planning and Project Management	254	0	01OCT98	30SEP99	30SEP99	0			
<b>1.1.06.12.03.05 776/777 CLUSTER DEACT INITIAL PHY DEACT</b>										
D5HD599G01	FY-99 Remove Classified from Gloveboxes	254	0	01OCT98	30SEP99	30SEP99	0			
D5HD599R10	FY-99 Remove Classified from Rooms	191	0	04JAN99	30SEP99	30SEP99	0			
D5HD599MSB	FY-99 Comp Rem/Disp'n Classif'd Items	0	0		30SEP99	30SEP99	0			
D5HD599R25	FY-00 Rem Loose Haz Materials from Rooms	254	1	01OCT99	29SEP00	29SEP00	0			
D5HD599MS5	FY-00 Comp Rem of Loose Haz Mtls from Rms	0	1		29SEP00	29SEP00	0			

4. The PBD describes the transfer of TRU/TRM operations in B776 by end of FY99 to B440 or to mobile systems for characterization. A review of the predecessor/successor schedule logic does not reflect this transfer of operations in the 2006 CPB Schedule. We recommend that K-H identify this transfer of operations in the 2006 CPB Schedule or make the necessary logic revisions/additions. The figure below depicts the successor relationships following B776 Storage and Staging that show relationships to the D&D of B776. We note that the Cluster Closure project for B776, Demolition of B776/777, and the Closure Cap for the 700 Area are on the 2006 CPB Schedule Critical Path but the B776/777 Storage and Staging Operations are not on the critical path. We recommend that K-H explain this issue.





5. The figure below depicts the predecessor relationships for the B776 Storage and Staging operations. In the 2006 CPB Schedule, it appears that the B776 Storage and Staging Operations are independent (i.e. no logic links) of B776 Deactivation and Decommissioning activities. Although Storage and Staging Operations are a LOE activity, it seems reasonable that these activities for the current FY and FY+1 could be integrated with the appropriate waste generation activities that will be utilizing B776 for storage based on the detailed information available at this time. There is a concern that if the durations are extended or requirements change in the Deactivation or Decommissioning areas, there are no logic relationships in 2006 CPB Schedule to the Storage and Staging Operations to reflect the impacts. This shortfall will effect the 2006 CPB Schedule's forecasting capabilities. We recommend that K-H review the relationships between Storage and Staging Operations and Waste Generation activities and make the necessary 2006 CPB Schedule modifications to the appropriate sequencing is reflected.



### 1.1.04.03.01.06 – B991 TRU/TRM Storage Operations

1. The scope of work for this element is to provide resources necessary to maintain B991 operations (TRU storage and staging) to allow for temporary storage within the Protected Area pending completion of transfer to B664 for shipment to WIPP. Typical activities include operations management, Training/Qualification, Procedure development, container movements, routine waste storage inspections, and other project management activities. Additionally, B991 serves as a location for classified TRU storage. B991 will house a portable headspace gas sampling and analysis unit to replace capacity currently in B776. As shown below the 2006 CPB Schedule adequately represents this WBS effort.

Activity ID	Activity Description	Orig Dur	Total Float	Early Start	Early Finish	2010 Early Finish	2010 Variance
<b>002 PBD 002 - Waste Management Project</b>							
<b>004 WAD 004 - TRU / TRM Project</b>							
<b>1.1.04.03.01.06 B991 TRU/TRM STORAGE OPERATIONS</b>							
A4EC160020	B991 TRU/TRM Storage Operations FY99	254	138	01OCT98	30SEP99	30SEP99	0
A4EC161000	B991 TRU/TRM Storage Operations FY00	254	138	01OCT99	29SEP00	29SEP00	0
A4EC161005	B991 TRU/TRM Storage Operations FY01	253	138	02OCT00	28SEP01	28SEP01	0
A4EC161010	B991 TRU/TRM Storage Operations FY02	254	138	01OCT01	30SEP02	30SEP02	0
A4EC161020	B991 TRU/TRM Storage Operations FY03	254	138	01OCT02	30SEP03		0
A4EMILE496	Complete B991 Storage of TRU Waste	0	138		30SEP03	30SEP02	-254

2. The activities representing this WBS reflected zero completion variances when compared to the 2010 CPB Schedule as shown above. However, the B991 Storage of TRU Waste completion Milestone indicates slip of approximately one year from the 2010 CPB Schedule. The basis for the slip appears to be a result of WM extending the use of B991 through FY03.
3. In the 2006 CPB Schedule, it appears that the B991 Storage and Staging Operations are independent (i.e. no logic links) of B991 Decommissioning activities. Although Storage and Staging Operations are a LOE activity, it seems reasonable that these activities for the current FY and FY+1 could be integrated with the appropriate waste generation activities that will be utilizing B991 for storage based on the detailed information available at this time. There is a concern that if the durations are extended or requirements change in the Deactivation or Decommissioning areas, there are no logic relationships in 2006 CPB Schedule to the Storage and Staging Operations to reflect the impacts. This shortfall will effect the 2006 CPB Schedule's forecasting capabilities. We recommend that K-H review the relationships between Storage and Staging Operations and Waste Generation activities and make the necessary 2006 CPB Schedule modifications to the appropriate sequencing is reflected.
4. As indicated below, Storage Operations in B991 for FY03 are concurrently scheduled with Deactivation of B991 in FY03. There is a concern as to the reasonableness of the concurrent (as opposed to sequential) scheduling of Building 991deactivation and waste storage operation activities. We recommend that K-H ensure that this sequencing is reasonable and is in accordance with DOE assumptions.

Activity ID	Activity Description	Orig Dur	Total Float	Early Start	Early Finish	FY99	FY00	FY01	FY02	FY03
000 PBD 000	RFETS Site Level Activities									
000 WAD 000	RFETS Site Level Activities									
1.1	ACHIEVE INTERMEDIATE SITE CONDITION									
A0FY199900	MILESTONE - START FY99	0	0	01OCT98*						
002 PBD 002	Waste Management Project									
004 WAD 004	TRU / TRUM Project									
1.1.04.03.01.06	B991 TRU/TRM STORAGE OPERATIONS									
A4BEGWPD04	Start WPD 04	0	91	01OCT98						
A4EC160020	B991 TRU/TRM Storage Operations FY99	254	138	01OCT98	30SEP99					
A4EC161000	B991 TRU/TRM Storage Operations FY00	254	138	01OCT99	29SEP00					
A4EC161005	B991 TRU/TRM Storage Operations FY01	253	138	02OCT00	28SEP01					
A4EC161010	B991 TRU/TRM Storage Operations FY02	254	138	01OCT01	30SEP02					
A4EC161020	B991 TRU/TRM Storage Operations FY03	254	138	01OCT02	30SEP03					
A4EMILE496	Complete B991 Storage of TRU Waste	0	138		30SEP03					
021 PBD 021	Building 991 Cluster Closure Project									
037 WAD 037	991 Cluster Project									
1.1.06.23.03.01	991 CLUSTER DEACTIVATION CHARACTERIZATION									
D700099110	Deactivation - Cluster 991	254	138	01OCT02	30SEP03					

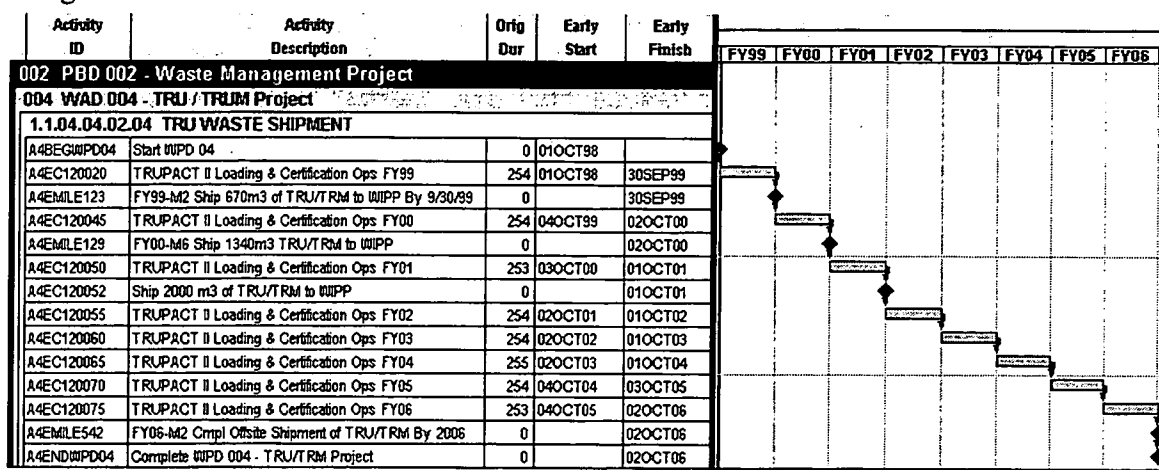
5. The PBD describes the transfer of B991 portable headspace gas sampling and analysis unit to replace capacity currently in B776. Additionally, the PBD states there will be a transfer of the B991 TRU Storage and Staging to B664. A review of the 2006 CPB Schedule logic relationships disclosed that the transfer of operations between buildings are not represented.

#### 1.1.04.03.01.08 – TRU/TRM Waste Projects

1. The scope of this element includes development and implementation of special projects related to TRU/TRM waste management, characterization, treatment, transportation, and/or disposal. Specifically, this covers: project controls, planning & scheduling, budget monitoring and performance reporting, program QA and maintenance, program document control and program safety control and maintenance. A review of the 2006 CPB Schedule disclosed that the WBS activities are adequately described and are logically related within this LOE. However, these TRU/TRM waste management activities have no integration links with waste generation sources.

#### 1.1.04.04.02.04 – TRU Waste Shipment.

1. The scope of this element includes certification, loading, and shipment of previously characterized drums of TRU to WIPP and/or newly generated residue wastes. Specific activities consist of transfer and receipt of pre certified containers from existing storage facilities to B664 for loading, preparation (labeling, marking, inspection, certification) of drums for loading, load management tasks, and shipment preparation. The figure below shows that the WBS activities as described in the PBD are adequately described in the 2006 CPB Schedule and are logically related within this LOE. However, this review finds that the TRU/TRM waste shipment activities have no integration links with waste management or waste generation sources.



2. The completion of TRU Waste Shipment is correctly tied into the completion Milestones for Waste Management and Site Closure.

#### WAD 005 – TRU/TRM Construction Project

This project consists of design and construction activities associated with the Building 460 Conversion to Storage Project, the Building 440 Characterization and Shipping Project and a portable TRU Pact II Shipping and Characterization Facility. We anticipate that all remaining storage capacity for TRU/TRM will be filled by 3Q FY99. Arrangements have been scheduled to store waste temporarily in Tents 2 and 12 on the 750 Pad and to store TRU/TRM more permanently in newly created storage areas within Building B440. This building is currently planned to be completely utilized by 3Q FY00. At that time, assuming WIPP has not opened, the Building 460 Conversion to Storage Project must be operational.

### 1.1.04.03.02.02 – Dev and Impl New TRM Waste Storage/Staging Facilities

1. The scope of this element for FY99 through FY01 includes renovation of Building 440 to allow storage of TRU/TRM waste, construction of a TRU/TRM Repackaging Facility inside Building 440, Building 460 Conversion Project design and construction, and installation of a portable TRU Pact II shipping station at a location that is to be determined. The activities representing this WBS appear to be accurately and logically reflected in the 2006 CPB Schedule.
2. The 2006 CPB Schedule activities representing this WBS reflected zero variances when compared to the 2010 CPB Schedule dates. The only exception found was the Milestone A5EC432160, Achieve Beneficial Occupancy for B440 Staging Module. This milestone has been accelerated by approximately 17 months as shown below. The basis for the acceleration is the removal of the B440 Shipping Module Construction scope as the predecessor effort for this milestone.

Activity ID	Activity Description	Orig Dur	Total Float	Early Start	Early Finish	2010 Finish	Finish Variance	
<b>002 PBD 002 - Waste Management Project</b>								
<b>005 WAD 005 - TRU / TRUM Construction Project</b>								
<b>1.1.04.03.02.02 DEV AND IMPL NEW TRM WSTE STOR/STAG FAC</b>								
T44 B440 New Storage Areas								
A5BEGWPD05	Start WPD 05	0	18	01OCT98			0	
A5EC432710	B440 Repack Module FY98 Change Notices	41	324	01OCT98	30NOV98	30NOV98	0	
A5EC437000	B440 New Storage Areas	123	0	11NOV98*	06MAY99	06MAY99	0	
A5EC432160	Achieve Beneficial Occ for B440 Staging Module	0	675		06MAY99	29SEP00	\$12	
A5ECPM0202	B440 Storage Upgrades Complete	0	0		06MAY99*	06MAY99*	0	

3. We note that the following activities within WAD 031 do not appear to meet K-H's Standard 10 Scheduling requirement:

*A. Activity Durations/Level of Detail. Current FY activities and FY+1 activities will generally be two working weeks to three months in duration, except for procurement, regulatory actions, or level-of-effort activities, which do not have intermediate points for performance measurement. Longer term durations for true level-of-effort activities are permissible. Activities scheduled from FY+2 through completion will have durations reflecting the level of scope development.*

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	
<b>002 PBD 002 - Waste Management Project</b>					
<b>005 WAD 005 - TRU / TRUM Construction Project</b>					
<b>1.1.04.03.02.02 DEV AND IMPL NEW TRM WSTE STOR/STAG FAC</b>					
A5EC437200	Modify B460 for TRU Waste Storage	191	01OCT99*	30JUN00	
A5EC437260	Port Ship System Construction	82	30DEC99	24APR00	

This creates a concern for the schedule accuracy based on the level of detail as reflected by the activity durations. We recommend that the activities be expanded and reflect the detail as required by K-H's Scheduling Standard 10.

#### **WAD 006 – Waste Disposal Project (Non-TRU)**

1. The Waste Disposal Project consists of activities that prepare, stage, load, transport, treat and dispose of low level, low level mixed, hazardous and non-radioactive waste types including waste chemicals.
2. The current process for management of these wastes is accomplished through the Waste Generation, Inventory, and Shipping Forecast published by the Waste & Remediation Operations Group (Appendix C). This document is a compilation of waste forecasts produced by the Waste Generators and provided to Waste Management. The document tracks on a monthly, and quarterly basis, estimates for waste volume, waste type and other necessary information. This is the current planning and forecasting mechanism that is utilized by Waste Management for determining Storage, Staging and Shipping forecasts. This is an independent effort from the 2006 CPB Schedule planning efforts and at this time is not integrated

#### **1.1.04.04.01.02 – Waste Certification and Oversight**

1. The key activities described in the PBD for this LOE work scope include verifications and training for radiation counts and NDA results, waste container data, and container integrity to name a few. Monthly reporting, periodic audits and other services are provided under this WBS. The work scope described in the PBD for WAD 006 – Waste Disposal Project (Non-TRU) was reviewed with the WBS activities to assure the PBD scope was accurately represented in the 2006 CPB Schedule. The entire work scopes appears to be adequately represented in the 2006 CPB Schedule for this WAD.
2. The activities representing this WBS reflected no finish variances when compared with the 2010 CPB.

#### **1.1.04.04.02.01 – LLMW Shipment**

1. The activities associated with this WBS are LOE providing the management and infrastructure to profile LLMW streams, assure WEMS entries, identify loads of shipments, validate containers, decant and add absorbent as necessary, verifications and compliance with DOT standards. The LOE activities as described in the PBD for this WBS are adequately incorporated into the 2006 CPB Schedule, as Package Certification LLMW for Disposal and Certify Shipment LLMW for Disposal.

**1.1.04.04.02.02 – LLW Shipment**

1. The activities associated with this WBS are LOE providing the management and infrastructure to profile LLW streams, assure WEMS entries, identify loads of shipments, validate containers, decant and add absorbent as necessary, verifications and compliance with DOT standards. The activities as described in the PBD for this WBS appear to be adequately incorporated into the 2006 CPB Schedule and are logically related within this LOE. However, these LLW shipment activities have no integration links with waste management or waste generation sources.

**1.1.04.04.04.03 – Chemical Disposition and Disposal Project**

1. The Waste Chemical Program is intended to provide a one-time removal of rad and non-rad waste chemicals for on site facilities. These activities as described in the PBD for this WBS appear to be adequately incorporated into the 2006 CPB Schedule and are logically related within this LOE. However, these disposition activities have no integration links with waste management or waste generation sources. We recommend the contractor provide the integration links in the 2006 CPB Schedule.

**WAD 048 – Liquid Waste Treatment Upgrades**

The Liquid Waste Treatment Upgrades Project consists of design and construction activities to provide new treatment capability for Site process waste water residuals.

**1.1.04.06.01.02 – Liquid Waste Treatment Upgrades Project**

1. The scope of work provides all design, construction, and start-up effort for operating, alternate or upgraded systems for radioactively contaminated process waste water until Site Closure is accomplished. The project will be completed in FY02; the operating systems will be covered by WAD 007, Waste Treatment. This project includes the Temporary Sludge Immobilization System (TSIS). A sludge immobilization system will be provided for treatment of the following waste streams:
  - a. Existing Low Level (LLW) and Transuranic (TRU) waste sludge stored in B374 and B774,
  - b. Backlog of LLW vacuum filter sludge drums stored in B964, and
  - c. Miscellaneous sludge generated during deactivation and closure.

The TSIS will be designed and constructed under a design build subcontract and will be installed onsite at a location which will allow efficient transfer of sludge for stabilization. The figure below shows the 2006 CPB Schedule activities representing this WBS effort.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	2010 Finish	Finish Variance	FY99	FY00	FY01	FY02
000 PBD 000 - RFETS Site Level Activities										
000 WAD 000 - RFETS Site Level Activities										
1.1 ACHIEVE INTERMEDIATE SITE CONDITION										
A0FY199300	1.1.04.06.01.01 LIQUID WASTE TREATMENT UPGRADES SUPPORT	0	01OCT98*			0				
002 PBD 002 - Waste Management Project										
048 WAD 048 - Liquid Waste Treatment Upgrades										
1.1.04.06.01.01 LIQUID WASTE TREATMENT UPGRADES SUPPORT										
E8BEGWPD48	Start WPD 48	0	01OCT98			0				
E8EG110805	TSIS Project Support	254	01OCT98	30SEP99	30SEP99	0				
1.1.04.06.01.02 LIQUID WASTE TREATMENT UPGRADES PROJECT										
E8EG120800	TSIS Project	254	01OCT99	29SEP00	29SEP00	0				
E8EG120810	TSIS Project	253	02OCT00	28SEP01	28SEP01	0				
E8EG120803	TSIS 90% Design Comp	0		29DEC00*	29SEP00	-62				
E8EG120815	TSIS Project	65	01OCT01	03JAN02		0				
E8EG120805	TSIS Design/Fab/Installation Substantially Comp	0		03JAN02	01AUG01*	-106				

2. We note that Activities E8EG120800, E8EG120810, E8EG120815 "TSIS Project" represent the construction and start up of the TSIS project do not appear to meet K-H's Standard 10 Scheduling requirement:

*A. Activity Durations/Level of Detail. Current FY activities and FY+1 activities will generally be two working weeks to three months in duration, except for procurement, regulatory actions, or level-of-effort activities, which do not have intermediate points for performance measurement. Longer term durations for true level-of-effort activities are permissible. Activities scheduled from FY+2 through completion will have durations reflecting the level of scope development.*

This creates a concern for the schedule accuracy based on the level of detail as reflected by the activity durations. We recommend that the activities for TSIS Project be expanded to include the construction of the TSIS Project and reflect the detail as required by K-H's Scheduling Standard 10.

### **WAD 062 - LLW/LLMW Storage Project**

This element provides the tasks related to management of the Site's LLW inventories. The activities as described in the PBD for this WBS appear to be adequately incorporated into the 2006 CPB Schedule and are logically related within this LOE. However, these activities have no integration links with waste management or waste generation sources.

#### **1.1.04.02.01.01 - Operate and Maintain Site LLW Storage Facility**

This element provides the tasks related to management of the Site's LLW inventories. Key activities within this WBS element involve receipt of LLW containers, field verification and maintenance of WEMS database, safety surveillances, quarterly radiological control surveys. Waste from B964 will be removed by September 30, 2001.



***Cost & Resource Loading Issues***

We performed a verification analysis of the budgeted costs found in the BEST and Primavera P3 schedule systems which are part of the basis for the 2006 Closure Plan. The results of this analysis indicate a match between each system's loaded costs and provides a good level of confidence that a true electronic link exists between the systems.

Further in depth cost and resource analysis can be found in section 4.6.

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#### 4.4.6 Environmental Restoration

##### *Approach*

The following comments, concerns and recommendations are the result of the team's review of those portions of the 2006 Closure Project Baseline (CPB) Schedule we felt were critical to site closure as scheduled in 2006. We did not review all of the 2006 CPB Schedule assumptions, scope and sequence; we reviewed a representative set of the Work Authorization Documents (WADs) within several critical Project Baseline Descriptions (PBDs). ER is comprised of PBD-001 Buffer Zone Closure Project, PBD-013 Closure Caps Project, and portions of PBD-014 Industrial Zone Closure Project. The comments below are organized by (WADs) and Work Breakdown Structures (WBSs). The selected WBS's were representative of the top level of the costs and critical path schedule work elements for Environmental Restoration.

The WBS's reviewed in connection with the PBD 001 Buffer Zone Closure are:

- WAD 083 WBS 11031206502 903 Pad Remediation;
- WAD 083 WBS 11030902 Misc. Inner Buffer Zone IHSS Remediation/Disposition;
- WAD 001 WBS 1103080401 Sitewide Groundwater Monitoring;
- WAD 001 WBS 1103060101 Surface Water Monitoring

The WBS reviewed in connection with PBD 013 Closure Cap Construction is:

- WAD 023 WBS 11041102 New Closure Caps Construction.

The WBS reviewed in connection with PBD 014 Industrial Zone Closure Project is:

- WAD 025 WBS 11053002 Misc. Industrial Zone IHSS Remediation.

##### *Basis & Assumption Issues*

See Section 4.1 for comments regarding planning and assumptions. Also see Section 4.7 for additional Environmental Restoration information.

##### *Scope Issues*

1. The basis of the project scope represented in the 2006 CPB Schedule was defined by the ER Group after a site assessment of the entire project site. This review resulted in identification of approximately 273 individual IHSS's/Potential Area of Concern (PAC)/Under Building Contamination and No Further Action (NFA) remediation sites. Of the 273 sites reviewed 58 were identified by the ER group to require further remediation action. These remediation efforts are the basis for the work scope the ER group has incorporated into the 2006 CPB Schedule.

The ER 2006 CPB Schedule work elements were then developed based on the general assumptions 1 and 2 (from ER Site Action Tracking Spreadsheet) for the 2006 Closure Plan.

Assumptions for ER:

1. Only the IHSSs/Potential Areas of Concern/Under Building Contamination listed in the Lane Butler to Allen Schubert Interoffice Memorandum (JLB-013-99), dated April 6, 1999, will require remediation.
2. No Further Action (NFA) sites will be identified and dispositioned as defined in Attachment 6 to RFCA. The NFA sites to be dispositioned will be those described in the Lane Butler to Allen Schubert Interoffice Memorandum (JLB-013-99), dated April 6, 1999.
2. The 2006 CPB Schedule detail activities for the ER Project were developed using a template approach; templates were then forwarded to ER subcontractors and their responses were integrated into the 2006 CPB Schedule. There were typically, additional activities and adjustments made for differences in durations for characterization levels, remedial actions, and other IHSS factors. Each template set of activities included a reasonable level of detail, which generally support the WBS scope description and technical strategy.
3. The K-H Schedule Standard 17 Schedule Integration states the Expanded Management Summary Schedule (EMSS) all RFCP milestones shall be uniquely identified, and traceable between the EMSS and CPB Schedule as shown from the following excerpt:

*"The Expanded Management Summary Schedule (EMSS) serves as the primary RFCP schedule integration tool ... The EMSS shall tie to the CPB ... All summary activities represented on the EMSS shall tie to the activity nodes in the CPB."*

A review of the 2006 CPB Schedule Milestones identified in the WAD reviewed have been verified to tie to the EMSS.

***Schedule Development Issues***

**PBD001 – Buffer Zone Closure Project**

**WAD083 – Buffer Zone Environmental Remediation**

This WAD scope involves characterizing and remediating areas of the environment contaminated with hazardous, toxic, and/or radioactive materials. Remediation of contaminated areas at the Site (termed IHSSs) entail removing as much of the source of contamination as possible. The remediation of high ranked IHSSs will be conducted by excavating the contaminated media, and subsequent use of containment and treatment technologies.

### 1.1.03.12.06.02 903 Pad Remediation

1. The scope of this WBS generally includes planning and remediation tasks associated with remediation of the 903 Pad Drum Storage Area, the 903 Lip Area, and the Americium Zone. Volumes of soils exceeding RFCA levels have not been finally determined, and remedial alternatives have not yet been determined. The general approach to the remediation of the pad follows a sequence of determination of contamination levels through subsurface radioactive contamination collection and sample analysis, Volatile Organic Compound (VOC) contamination collection and sample analysis, and for the Americium Area a gamma spectroscopy for surface plutonium. Once the contamination has been characterized cleanup levels will be determined based on the information developed. A review of the activities representing this work element in the 2006 CPB Schedule are logical and appropriately represent the work scope.
2. When the activities, predecessor and successor logic were reviewed for the WBS effort the 2006 CPB Schedule activities were found to adequately represent the work scope and reflected a logical and reasonable process for the 903 Pad remediation. The durations for the activities are derived from the template inputs from the subcontractors.
3. Milestones J3CMILE231- FY03-M4 Complete Remediation 903 Pad & Waste, J3GMILE241- FY-99-M11a Complete 903 PAD Characterization, J3GMILE242- FY-99-11b Complete 903 Pad RAD Borehole Characterization, and J3GMILE244- FY01-M1 Initiate 903 Pad Remediation were found to comply with the dates indicated on the EMSS Schedule.
4. In reviewing the 2006 CPB Schedule our findings reveal that the work element for the 903 Pad remediation is scheduled within the 2006 CPB Schedule as an independent project. The predecessor to the 903 Pad Remediation activity string is the Start WAD 083 milestone which is driven by its predecessor Start FY99 Activity Milestone. Additionally, the completion of the effort is tied to milestone for FY03 – M4 Complete Remediation 903 Pad and Waste. The 903 Pad Remediation is not contingent on other predecessor PBD activities. The current integration of this work element as an independent project seems reasonable and logical with the exception of their WM interface.
5. Pad Waste Treatment and Disposal are not integrated with the activities representing the Waste Management efforts. K-H P&I (P&I) has chosen to represent the WM relationships with two activities titled 903 Pad Waste Treatment and 903 Pad Waste Disposal. (See below) The relationship between WM and ER would be more appropriately reflected if the ER relationships were directly tied into the WM responsible activities.

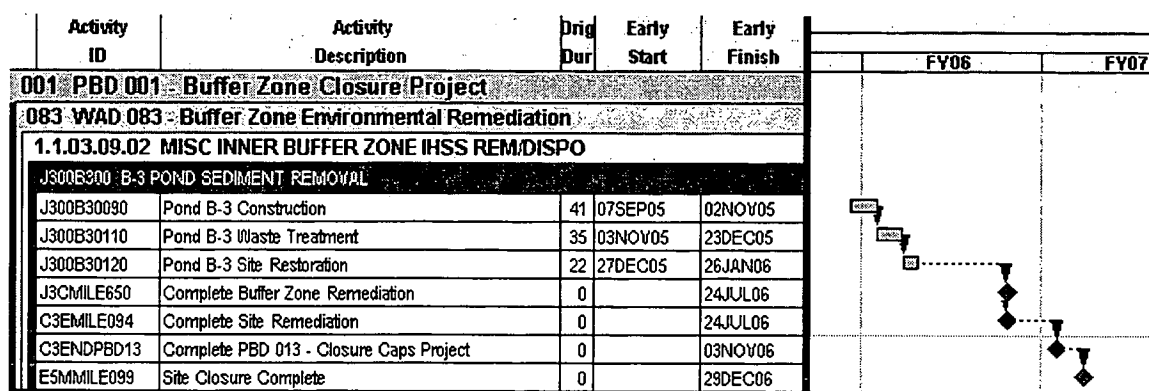
Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	FY01	FY02	FY03
<b>001: PBD 001 - Buffer Zone Closure Project</b>							
<b>083 WAD 083 - Buffer Zone Environmental Remediation</b>							
<b>1.1.03.12.06.02 903 PAD REMEDIATION</b>							
<b>GE6000</b>							
J3CMILE231	FY03-M4 Complete Remediation 903 PAD & Waste	0		16SEP03			
<b>GE600000 903 PAD REMEDIATION PLANNING</b>							
J3GE161530	903 Pad Mobilization & Site Preparation	60	25APR01	19JUL01			
J3GE161540	903 Pad Remediation	254	20JUL01	19JUL02			
J3GE161560	903 Pad Waste Treatment	254	17AUG01	16AUG02			
J3GE161565	903 Pad Waste Disposal	254	17SEP01	16SEP02			

### 1.1.03.09.02 Misc. Inner Buffer Zone IHSS Remediation/Disposition

1. This element includes the advance planning necessary to define the scope of work required to successfully remediate the specified IHSSs and PACs and obtain authorization for the work from the regulatory agencies. It includes pre-remediation characterization to determine the exact area that will be remediated, the actions necessary to receive agreement and authorization from the regulatory agencies on the scope of work to be performed for each area. This element also includes the characterization, remediation and final disposition of the contaminated material in the specified IHSSs and PACs. The activities generally included planning, characterization, implementation, and close out. A review of the 2006 CPB Schedule reflected adequate work scope coverage and a reasonable phased approach to remediation of these sites.
2. Per K-H P&I, these site activity groups are scheduled later in the 2006 CPB due to funding requirements and since they are non-D&D related their front-end lack of integration with the site efforts does not seem unreasonable.
3. Compliance with endangered species act is required in order to protect the Preamble's Meadow Jumping Mouse habitat, all field activities must be conducted outside of May 1 to the September 30 time window. A review of the 2006 CPB Schedule reflects all field activities being conducted are outside this time frame.
4. Milestones J3CMILE243 "Remediate PU& D Yard Storage Area NFA" complies with the date indicated on the EMSS Schedule.
5. A review of the 2006 CPB Schedule logic and activities reflects that there are no interrelationships within a particular group under this WBS element. For example Group NE-1 (Ponds B-1, B-2, and B-3) shows no dependencies between the different ponds. Each string of activities is driven by date constraints and are currently reflected as an independent effort with the remainder of the project. In discussion with K-H P&I, we found that the set sequence for the ponds indicates that all ponds will be done in the same FY year and the date constraint is based on funding availability. K-H P&I for ER prefers to drive the independent groups of activities with funding requirements using date constraints versus incorporating and statusing an activity to indicate funding requirement constraints. The scheduling approach

used by K-H P&I for this WBS is reasonable and logical, however relationships between the individual B-series ponds might be considered since they are dependent upon one another.

6. The relationship between ER and WM is reflected below:



In response to the lack of WM integration logic, ER has created their own WM activities (that are not maintained by WM) for waste treatment and management to represent the interface to the WM effort. This presents several problems:

- WM is not responsible for status of these activities added by ER and therefore may not reflect accurate WM status.
- Since there is no interface logic to the actual WM activities, changes to these activities would not translate down to the ER activity forecasts.
- The ER added activity Original Duration (for WM activities) calculations are not from WM and may not be in accordance with WM assumptions.

### WAD 001 Buffer Zone Misc. Clusters Project

This project scope involves the performance of groundwater/surface water monitoring, regulatory reporting and wastewater/stormwater management field operations, OU1 Closures, OU3 Closures, OU5 Closure and OU6 Closure.

#### **1.1.03.08.04.01 Sitewide Groundwater Monitoring**

1. The scope for this element is defined by the RFCA Groundwater Program comprising all activities conducted to assure compliance with the RFCA Agreement, State and Federal regulations (e.g., RCRA and CERCLA) and DOE Orders for RFET. The Program consists of LOE efforts that include groundwater sampling, water level measurements, sample and data management, well development and abandonment. The technical strategy for the groundwater program will establish potential areas of concern for contamination of surface water by monitoring contaminant plumes. Performance monitoring will be conducted on a case by case basis for source removal actions and building D&D actions. The 2006 CPB baseline

schedule reflects the same LOE activities and sequence of efforts for FY99 through FY06. The activities identified RFETS Groundwater monitoring, RFCA IM/IRA Compliance, RFCA Groundwater reporting, Groundwater Monitoring Services, and RFCA Groundwater Evaluation and Reporting. Generally, the schedule activities are consistent with the work scope description in the PBD.

2. The activities are LOE and consist mainly of monitoring and reporting efforts. There are no integration links to other scheduled activities, internal or external WADs or PBSs indicated in the 2006 CPB Schedule. The activity structure for the Sitewide Groundwater Monitoring is logically and adequately represented in the 2006 CPB Schedule.

#### **1.1.03.06.01.01 Surface Water Monitoring**

1. The Surface Water Monitoring program activities include water sampling and assessment to support Clean Water Act/NPDES Compliance, radionuclide monitoring of Site effluent; State regulatory monitoring; Rocky Flats Cleanup Agreement (RFCA) monitoring; Flow Monitoring for RFCA and Clean Water Act; reporting for CWA and RFCA compliance; Stakeholder reporting as needed as well as hydrologic monitoring; development of an Annual Sewage Sludge Report; and support to RFETS initiatives before the Colorado Water Quality Control Commission Hearings. The 2006 CPB Schedule reflects consistent monthly reporting and yearly monitoring in accordance with the PBD scope.

### **PBD013- Closure Caps Project**

#### **WAD023 – Closure Cap Project**

The purpose of the Closure Caps project is to cap areas of the site where it may be impractical to remediate to acceptable risk levels for the intended land use in accordance with the RFCA vision for the industrial area. The work scope includes capping portions of the 700 area, removing pavement and building foundations and recontouring, regrading, and revegetating the remainder of the industrial area. This capping effort would be conducted after IHSS remediation and D&D activities have been completed. The closure cover activity includes removal of the Site pavement and building foundations, design and placement of the cap over the 700 area, recontouring, regrading and revegetation of the industrial area. The actual onsite work activity will primarily consist of construction activities such as moving dirt and gravel using heavy equipment.

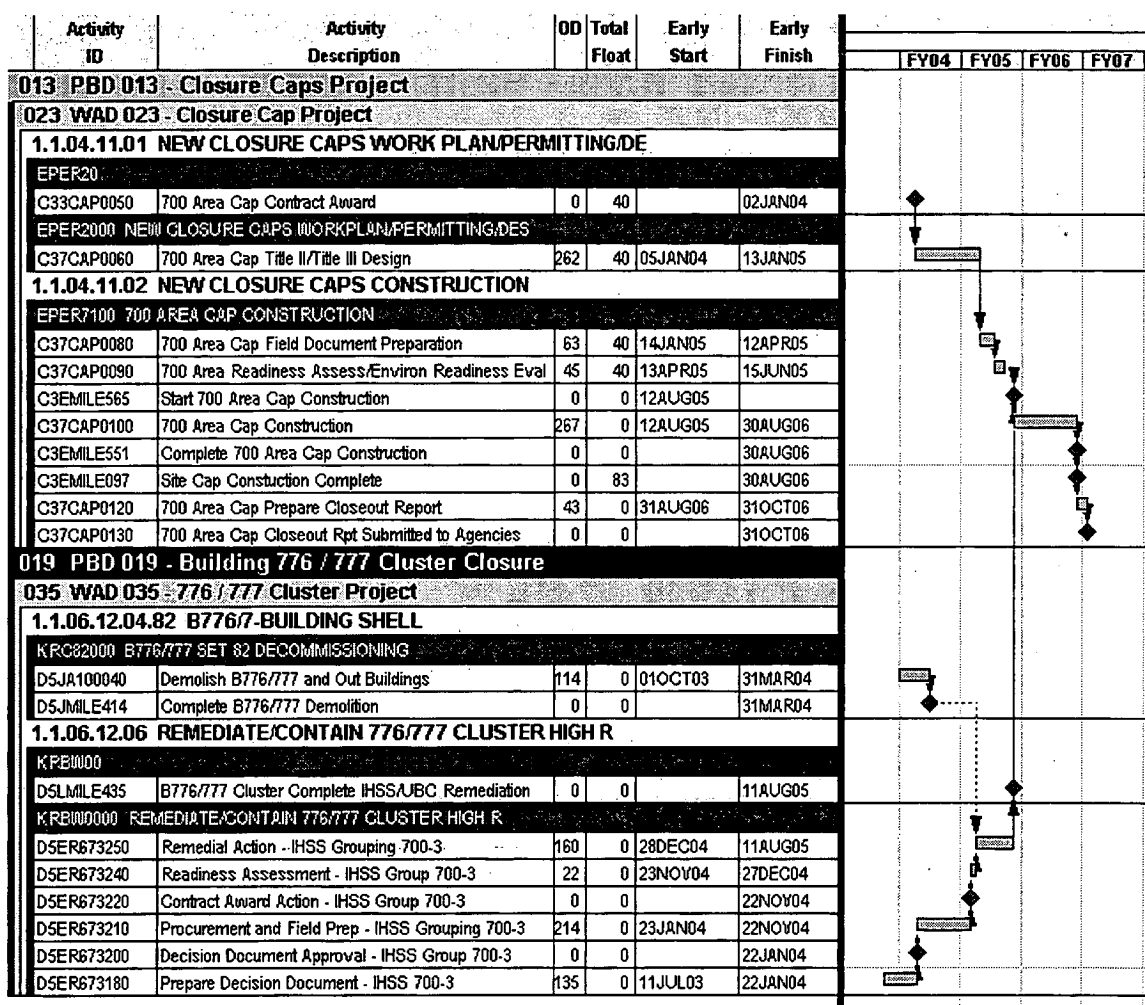
#### **1.1.04.11.02 New Closure Caps Construction**

1. The work task scope for this WBS involves mobilization of numerous subcontractors for trucking, earthmoving, soil and material suppliers, survey crews, and sanitary facilities; readiness review, construction performance, demobilization, closeout report, agency



responses, and preparation of a final report. Figure A below reflects the activities in the 2006 CPB Schedule that define the work scope associated with this WBS. A review of these activities finds that there is a reasonable level of detail and they generally support the WBS scope description and technical strategy.

2. The integration of the 700 area Closure Cap with the critical path drivers is shown for this effort in Figure A below. A review of the critical items driving the construction of the 700 area cap disclosed that they are logical and adhere to the technical strategy and approach that the capping effort would occur after IHSS remediation and D&D activities have been completed.
3. The figure below also shows logical integration with the project completion milestones.



**PBD014 – Industrial Zone Closure Project****WAD025 – Industrial Zone Clusters Project**

The work scope for this PBD includes the remediation of the Old Process Waste Line (OPWL) consisting of six miles of older process waste lines; the New Process Waste Line (NPWL) that feeds into the liquid waste treatment facility in Building 374; areas of IHSS's integral to both lines, former spill locations, waste dumping areas, tanks and drum areas, waste storage areas, and other limited areas of contamination.

**1.1.05.30.02 Misc. Industrial Zone IHSS Remediation**

1. The scope description for this work element is the same as described above.
2. The overall schedule philosophy of the planning and characterization in the Technical Strategy of the Project Baseline Description states:

*Because of the complexity of the remediation tasks in the Industrial Area, the general rule is that one year is required for the planning and characterization process (planning documents, agency review and approval, sampling, data analysis) and one year is required for remediation (subcontractor procurement, mob/demob, field construction, confirmatory sampling, data analysis, closeout reporting). Because the 2006 closure strategy significantly compresses the schedule, the remediation schedule becomes compressed as well, and is especially dependent on the progress of D&D activities. To address the D&D issue, the general strategy is to initiate characterization during the last year of D&D for those D&D dependent IHSS/PAC/UBC's and begin remediation immediately following completion of D&D.*

This process is reflected in the 2006 CPB baseline schedule through a series of negative logic ties between D&D and ER activity groups. K-H P&I has incorporated the negative lag relationships (lag value is the amount of time KH requires for Planning prior to D&D) to start the planning process before the start of D&D per their technical strategy. Had they incorporated an activity, date constraint or tied their efforts to another group of activities a slip in D&D would not have also slipped the ER Planning and Characterization process. This is the effect that KH wants to achieve with this relationship. However, uncharacteristic this technique may be from an industry standard scheduling technique, this is a reasonable and logical approach for the effect K-H wants.

3. Each IHSS group is driven by the start milestone. The first activity for each group, "SAP Preparation" is driven by a date constraint. The date constraints used by the ER group are based on available or forecasted funding. This is the methodology that K-H P&I prefers to use versus an activity representing funding constraints that requires monthly updating.
4. The SAP Preparation and SAP Approvals reflect no Agency Review cycle. K-H P&I has stated that this effort is included in the SAP Preparation activity duration of 40 days. A

review of the ER templates for SAP, show that the Sample Plan Analysis Prep duration includes the Plan Preparation, Reviews, and Comment Incorporation. Typically it is standard scheduling practice to schedule separately those activities with differing work scope and/or responsibilities.

#### **1.1.05.30.02 Misc. Industrial Zone IHSS Remediation**

1. In reviewing the 2006 CPB Schedule the activities representing this remediation effort follow a similar process and sequencing for each group of IHSS sites. Each group has the same start milestone as a predecessor to the start of the remediation effort. The predecessor is C5BEGWAD25 "WAD 25 Industrial Zone Closure Begins" Additionally, the Closeout Report of the effort is tied FF +20 to Activity C5HE013100 IA Final CAD/ROD Support to DOE."
2. Each group as stated above is driven by the WAD 25 Industrial Zone Closure Begins Milestone. The first activity for each group, "SAP Preparation" is driven by a date constraint. The date constraints used by the ER group are based on available or forecasted funding. This is the methodology that K-H P&I prefers to use versus an activity representing funding constraints that requires monthly updating.
3. As shown below, SAP Preparation and SAP Approvals reflect no Agency Review cycle. K-H P&I stated that this effort is included in the SAP Preparation activity duration of 40 days. A review of the ER templates for SAP, show that the Sample Plan Analysis Prep duration includes the Plan Preparation, Reviews, and Comment Incorporation.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	FY03	FY04
<b>014 PBD 014 Industrial Zone Closure Project</b>						
<b>025 WAD 025 Industrial Zone Clusters Project</b>						
<b>1.1.05.30.02 MISCELLANEOUS INDUSTRIAL ZONE IHSS REMED</b>						
<b>C50002</b>						
C500020110	SAP Approval by Agencies - IHSS Group 000-2	0		25AUG04		◆
<b>C5000200 IHSS GROUPING 000-2 (OPMIL)</b>						
C500020100	SAP Preparation - IHSS Group 000-2	40	30JUN04	25AUG04		□
<b>C50004</b>						
C500040110	SAP Approval by Agencies - IHSS Group 000-4	0		25NOV02	▶	
<b>C5000400 IHSS GROUPING 000-4 (NPIWL)</b>						
C500040100	SAP Preparation - IHSS Group 000-4	40	01OCT02*	25NOV02		
<b>C55005</b>						
C550050110	SAP Approval by Agencies - IHSS Group 500-5	0		25NOV03		◆
<b>C5500500 IHSS GROUPING 500-5</b>						
C550050100	SAP Preparation - IHSS Group 500-5 (Non D&D)	40	01OCT03*	25NOV03		□
<b>C58006</b>						
C580060110	SAP Approval by Agencies - IHSS Group 800-6	0		25NOV03		◆
<b>C5800600 IHSS GROUPING 800-6</b>						
C580060100	SAP Preparation - IHSS Group 800-6 (Non D&D)	40	01OCT03*	25NOV03		□
<b>HE1004</b>						
C5HE614110	SAP Approval by Agencies - IHSS Group 100-4	0		25NOV03		◆
<b>HE100400 IHSS GROUPING 100-4</b>						
C5HE614100	SAP Preparation - IHSS Group 100-4 (Non D&D)	40	01OCT03*	25NOV03		□

### Cost and Resource Loading

We performed a verification analysis of the budgeted costs of the 2006 CPB BEST and the 2006 CPB Schedule Primavera P3 systems. The results of this analysis indicate a match between each system's loaded costs and provides a good level of confidence that a true electronic link exists between the systems.

Further in depth cost and resource analysis can be found in section 4.7.

#### 4.4.7 Schedule Risks

The 2006 CPB Schedule identifies the scope of work required to achieve site closure by 2006. However, there are many uncertainties and risks, some identified in the project assumptions and others for which there is no accounting, which could affect K-H's ability to effectively execute the 2006 CPB Schedule. Below are some examples of these uncertainties and risks. We recommend that the following observations be incorporated into a risk and uncertainty check list for use in project risk management workshops and other risk management activities.

##### General

1. Obtaining and retaining resources in the expanding local construction market.
2. Technology that is anticipated to facilitate process efficiency but is not yet fully developed and functioning including:
  - a. PuSPS
  - b. 776 "Birdcage"
  - c. 771 Bottle Box Operations - what will be done with remaining liquids after bottle box glove box in 771 is removed?
3. Presence of un-classified sludges and no method for treating and no destination determined for them.
4. The assumption of increased efficiency each year. Many of the items in this section could affect K-H's projections on efficiency.
5. The Labor Agreement assumptions as outline below:
 

*"There will be no significant changes to the deployment of personnel under the (1) Collective Bargaining Agreement between K-H and the United Steelworkers of America (AFL-CIO-CLC) Local Union 8031, dated October 13, 1996, (2) the Project Labor Agreement (PLA) between K-H and the Colorado Building and Construction Trades Council dated December 16, 1997, (3) the Work Assignment Guidelines dated January 12, 1996, and (4) the Collective Bargaining Agreement between Wackenhut Services, LLC and the United Government Security Officers of America, Local No. 1, dated November 6, 1994."*
6. Obtaining the many Regulatory approvals needed to process, move and dispose of waste including the crucial WIPP RCRA Part B permit.
7. Funding limits which could affect quantity of work performed and funding of any work required to be accelerated to achieve closure by 2006.
8. The Waste Management schedule which is not fully developed to define the path of treatment.
9. Any latent, unknown conditions which may be found, i.e. more waste than anticipated, higher volatility of waste discovered, discovered conditions within buildings, etc., that require unique solutions.

10. Weather for this region and across the country which could affect the ability of the trucks to ship waste.
11. A path for treatment of some LLMW which needs to be defined.
12. A path for disposal of LLMW with TRU elements between 10 and 100 nCi/g which needs to be defined.
13. Any major discovery issues which affect authorization basis (a USQ) or criticality safety which can impact the ability to perform SNM Removal/Deactivation, Decommissioning and Mission Work simultaneously. This is a concern from a safety and feasibility point of view.
14. Regulatory authority approval of onsite waste storage plans or external stakeholders challenging waste storage in tents to support SNM and D&D operations
15. Regulatory agency acceptance of document review schedules as described in RFCA.
16. Regulatory agency approval of an overall IA Characterization Plan that enables site specific planning information to be added as addenda.
17. Any catastrophic failure to facility systems and/or processes.
18. Adequate Work Force clearances must be granted by DOE as planned/projected.
19. If RFETS has a seismic event that requires re-entry inspections as described in DDS-068-98, the schedule could be impacted.
20. The assumption that no significant, unplanned DNFSB recommendations will be received that could affect resources, schedules or cost
21. The assumption that the Nevada Test Site (NTS) will remain open and accept project remediation wastes.
22. The assumption that Enviro-Care will remain open and continue to accept LLMW.
23. The assumption that Savannah River, Oak Ridge Y-12, WIPP and NTS will receive material according to the Closure Project Baseline Schedule.
24. The assumption that DOE Orders and other requirements for protection and accountability of nuclear materials; handling and management of materials; operation of facilities; waste management; environment, safety, and health; administration of capital projects; and contractual obligations will not significantly change during the life of these projects.
25. Process efficiency (which includes transportation, equipment reliability, operating personnel availability, building availability) will be no less than 75 percent.
26. DOE does not have a contract with any contractor to perform site closure activities after June 2000. New contracts or contractors must be procured in order to stay on schedule.
27. Sufficient SNM needs to be removed such that all CAT I and II items or quantities that roll-up to CAT I are removed including holdup. This will permit MAA closure.
28. Sufficient SNM needs to be removed such that all CAT II items or quantities that roll-up to CAT II quantity are removed including holdup. This will permit PA closure.

29. Sufficient SNM needs to be removed such that all CAT III items or quantities that roll-up to CAT III are removed. This will permit LA closure.
30. Required NEPA actions to enable closure work at the Site to occur in a way that allows the work to proceed as planned in the 2006 CPB Schedule.
31. Residual SNM continues to be discovered after the PuSPS has been shut down and the guard force has been restructured for non-plutonium operations.
32. No new federal or state laws are passed which substantially modify the existing parameters of nuclear waste disposal.

#### **Pu Processing & Packaging Project**

1. The assumption that the DOE supplied Government Furnished Equipment (GFE), BNFL Packaging System will perform as designed without significant modifications.
2. The Packaging System is assumed to be capable of continuous operations, without excessive maintenance, such that its availability will be not less than 72%.
3. The Packaging System is also assumed to be capable of functioning at a minimum rate of not less than 1 container every 2 hours, either metal or oxide.
4. The assumption that, per DOE-STD-3013, Loss-On-Ignition testing, Supercritical Fluid Extraction and/or other approved methods for testing the moisture content of plutonium oxide will be available in time to support the schedule and be successful for all subject oxides.
5. A DOE approved deviation path is available for packaging and shipping materials in 3013s which cannot meet the 3013 standard (low Pu content, moisture cannot be measured accurately, etc.).
6. The assumption that repackaging of materials which cannot meet the 3013 standard will be minimal (0% for metals, less than 5% for oxides).
7. The assumption that data obtained from the HSP 31.11 surveillance program will not result in a change to the surveillance requirements for plutonium metal.
8. The assumption that data and a technical basis will support the elimination of surveillance requirements per HSP 31.11 for material that is packaged in DOE-STD-3013 containers.

#### **Salt Stabilization Project**

1. Change is required in the configuration, location, or operability requirements for treatment systems in operation due to DOE direction.

#### **Dry Residue Elimination Project**

1. The assumption that WIPP will accept proposed alternatives to Passive-Active Drum Counter: Segmented Gamma Scanner, Neutron Multiplicity Counter/Gamma Ray Isotopic, and for LECO crucibles, statistical verification of existing count sheets.

2. The assumption that WIPP will accept measured hydrogen generation rate data that is within limits for existing drums containing <200 Fissile Gram Equivalent (FGE), but exceeding wattage limits.

### **SNM Shipping Project**

1. The assumption that DOE regulations will not require changes to existing Material At Risk (MAR) criteria in the Facilities.
2. Criticality Safety Operating Limits (CSOLs) evaluations are assumed to allow for full operation and material handling as planned.
3. The assumption that no SNM will be received from outside RFETS.
4. Safe Secure Transports (SSTs) are assumed to be made available by the Transportation Safeguards Division to support baseline SNM shipping schedule and the loading configurations do not change their capacity.
5. Operations throughput from the PuSPS are assumed to support the shipping schedules required.
6. Chalfant 9965, 9968 and 9975, DOT-6M, DT-22, FL, and UNC-2901 shipping containers must be certified for the intended use and available when needed.
7. K-H assumes that the respective SARP for the Chalfant 9965, 9968 and 9975, DOT-6M, DT-22, FL, and UNC-2901 shipping container will not be changed in a manner affecting use.
8. The following is assumed with regard to the receiver sites:
  - a. Receiver availability (including container turnaround/refurbishment) will not restrict shipment schedules;
  - b. Receivers, LANL, LLNL, ORNL Y-12, Pantex, SRS, and TVA, will be ready and prepared to accept material based upon a mutually agreed upon schedule;
  - c. Receiver downtime will not prevent shipments.
9. SNM shipping could experience delay from the following sources:
  - a. Transportation permits
  - b. Equipment - TRUPAC trucks in sufficient quantity to handle shipping

### **B371 Residues Elimination Project**

1. The assumption that the Wet Combustible production rates will be met on a weekly basis. If not, the use of the 5th day during a 5-day work week, AWS.
2. The assumption that the Savannah River will receive Plutonium Fluoride shipments in November 1999.
3. The assumption that materials that are greater than 10% plutonium by weight will be blended down to less than 10% plutonium by weight.



4. The assumption to be acceptable for solid residues that are listed as hazardous waste may, after treatment, to be stored without meeting Land Disposal Restrictions (LDR's) per Compliance Order on Consent No. 93-04-23-01.
5. The treated residues are assumed to be TRU waste.
6. The assumption that the Residue Environmental Impact Statement (EIS) will be approved in time to meet production and shipping metrics.
7. The Non-Destructive Assay (NDA) equipment installed for the baseline processes (SGS) is assumed to be sufficient to meet through-put as well as WIPP and safeguards requirements.
8. The assumption that unexpected conditions such as contaminated drums, contents different than marked, damaged containers, etc will not be encountered in more than 10% of the feed material for SS&C, 10% of the feed material for Wet Combustibles repack and 60% of the feed material for Wet Combustibles gas generation testing. Gas Generation Testing efficiency is assumed to be no less than 80%.
9. The assumption that on site transportation and Waste Management capabilities will support residue processing requirements.

#### **371/374 Cluster Project**

1. The facility is assumed to be maintained at an operability of a minimum level of 90% for required nuclear operations.

#### **750 Pad Cluster Project**

1. The assumption that a new TRU waste storage facility will be available to relocate TRU/TRM waste from Tents 2 and 12 prior to the commencement of decommissioning activities in FY2004.
2. The assumption that IHSS 214 will require No Further Action.
3. A/B requirements for storage of TRU/TRM waste must be approved by 10/1/99.

#### **776/777 Cluster Project**

1. The facility is assumed to maintain a 90% availability for Nuclear Operations and will maintain a production efficiency of 85%.

#### **779 Cluster Project**

1. The assumption that the demolition of the 779 Cluster, as documented in the D&D completion report, will be accepted by RFFO as the only documentation required to demonstrate close-out of all Pu vulnerability corrective action milestones.

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